PACIFIC GAS AND ELECTRIC COMPANY

2013-2014 ENERGY EFFICIENCY PORTFOLIO

STATEWIDE PROGRAM IMPLEMENTATION PLAN

CODES AND STANDARDS

PGE2105

APRIL 23, 2013

Table of Contents

1. Codes and Standards, PGE2105, core program

2. Program Budget Tables

Table 1[1]: Total Program Budget (including 2010-2012 Carryover)

Program ID	Codes and Standards	Total Administrative	Total Marketing & Outreach	Total Direct Implementation	Total 2013-2014 Budget	2010-2012 Carryover
PGE21051	**Building Codes Advocacy**	$ 310,993	$0	$ 5,414,734	$ 5,725,727	$ 263,459
PGE21052	**Appliance Standards Advocacy**	$ 75,280	$0	$ 3,544,921	$ 3,620,202	$ 166,577
PGE21053	**Compliance Improvement**	$ 176,606	$0	$ 1,078,009	$ 1,254,615	$ 57,729
PGE21054	**Reach Codes**	$ 38,136	$0	$ 331,864	$ 370,000	$ 17,025
PGE21055	**Planning and Coordination**	$ 141,186	$0	$ 1,384,703	$ 1,525,889	$ 70,211
Total		**$ 742,201**	**$0**	**$ 11,754,231**	**$12,496,433**	**$575,000**

3. Projected Program Impacts Tables

Table 2.1: Total Projected PG&E Program Savings by Subprogram (With Interactive Effects)

	Building Codes Advocacy			Appliance Standards Advocacy			Compliance Improvement			Reach Codes		
	GWh	MW	MTherms	GWh	MW	MTherms	GWh	MW	MTherms	GWh	MW	MTherms
Gross	199	47	4.5	1,188	145	-6.0	35	5.4	0.1	3.5	0.0	0.15
Net	60	15	2.3	418	46	-1.9	12	1.7	0.1	2.5	0.0	0.11

Table 2.2: Total Projected PG&E Program Savings by Subprogram (Without Interactive Effects)

	Building Codes Advocacy			Appliance Standards Advocacy			Compliance Improvement			Reach Codes		
	GWh	MW	MTherms	GWh	MW	MTherms	GWh	MW	MTherms	GWh	MW	MTherms
Gross	199	47	4.8	1,188	145	2.4	35	5.4	0.30	3.5	0.0	0.15
Net	60	15	2.4	418	46	0.95	12	1.7	0.15	2.5	0.0	0.11

[1] Definition of Table 1 Column Headings: Total 2013-2014 Budget is the sum of all other columns presented here.

Tables reflect data from the Navigant Potential Study which provides an update to the forecasted savings for Title 24 building codes attributable to the Investor Owned Utility (IOU) Codes and Standards (C&S) advocacy programs, based on more recent construction data provided by the California Building Industry Association (CBIA). This update lowered construction rates based on current and forecasted economic conditions, which led to a downward adjustment to savings estimates for IOU codes and standards programs.

- 2003 Title 24 (Building regulations adopted in 2003 and effective in 2005, we have previously referred to these as 2005 Title-24.)
- 2004 Title 20 (Appliance regulations adopted in 2004 and effective in 2006, 2007 or 2008, we have previously referred to these as 2005 Title 20.)
- 2006 Title 20 Tier II Lighting (Adopted in 2006, effective in 2008.)
- 2008 Title 24 (Adopted in 2008, effective in 2010.)
- 2008 Title 20 (Lighting standards adopted in 2008, effective in 2010, 2011, 2012, and 2013.)
- 2009 Title 20 (Television standards adopted in 2009, effective 2011 and 2013.)
- 2011 Title 20 (Battery charger standards adopted 2012, effective 2014.)
- Various Federal appliance standards (motors, vending machines, commercial refrigeration, ASHRAE products, etc.)
- 2013 Title 24 (Building regulations adopted in 2012, effective 2014.)

Per Energy Division request, Table 2.1 shows gross and net savings with interactive effects, and Table 2.2 shows gross and net savings without interactive effects. Savings for Table 2.1 and Table 2.2 are calculated from the sum of first-year gross savings from each CEC proceeding in 2009, 2010, and 2011. Gross savings are calculated from projected statewide installations, compliance, energy use baseline, and unit energy savings, prior to correcting for naturally occurring market adoption and attribution.

Compliance improvement savings are based on allocations from building codes and appliances standards advocacy savings attributable to IOUs: 5% of savings from previously adopted building codes, and 2% of savings from previously adopted state and federal appliance standards.

4. Program Mission

The Codes and Standards (C&S) program saves energy on behalf of ratepayers by influencing continuous improvements in energy efficiency regulations, improving compliance with existing codes and standards, and working with local governments to develop ordinances that exceed statewide minimum requirements. Both the C&S program advocacy and compliance improvement activities extend to virtually all buildings and potentially any appliance in California.

The C&S program conducts advocacy activities to improve building and appliance efficiency regulations. The principal audience is the California Energy Commission (CEC) which conducts periodic rulemakings, usually on a three-year cycle (for building regulations), to update building and appliance energy efficiency regulations. C&S also seeks to influence the United States Department of Energy (DOE) in setting national energy policy that impacts California.

In some cases we may seek to influence the state legislature and other state agencies like California Air Resources Board (CARB) to influence policy regarding buildings and appliances. We may explore ways to influence the US Congress outside the traditional means of negotiating though Federal partners such as American Council for an Energy Efficient Economy (ACEEE) or Appliance Standards Awareness Project (ASAP).

Codes And Standards Enhancement (CASE) studies, focused on energy efficiency improvements, are developed for promising design practices and technologies and presented to standards- and code-setting bodies. Advocacy also includes affirmative expert testimony at public workshops and hearings, participation in stakeholder meetings, ongoing communications with industry, and a variety of other support activities.

The program participates in DOE proceedings and legislative negotiations leading to federal regulations that are passed through to California; in particular, Title 20 appliance efficiency regulations that are the same as Federal regulations.

Following adoption, C&S supports compliance improvement with both Title 24 building codes and Title 20 appliance standards. Compliance improvement activities complement the advocacy work by maximizing verified savings from codes and standards that are realized and persist over time. The Compliance Improvement subprogram targets market actors throughout the entire compliance chain, providing education, outreach, and technical support and resources to improve compliance with both the building and appliance energy standards. Compliance improvement responds to the CPUC's interest in robust implementation of existing standards and support for the California Long Term Energy Efficiency Strategic Plan's HVAC Big Bold strategies. The program carries out strategic activities that support or shape future codes and standards. In addition to mandatory minimum-level codes, the C&S program advocates for the development and implementation of "reach codes" that exceed minimum state code requirements and may be adopted by local jurisdictions or agencies. The program monitors and/or participates in a wide range of activities or proceedings that have direct or indirect impacts on California regulations including, but not limited to American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), international activities involving Europe, Asia, Canada, and Australia, voluntary standards such as green building codes, and ratings organizations such as the Cool Roof Rating Council (CRRC), National Fenestration Rating Council (NFRC), and the United States Green Building Council (USGBC). Additionally, the program intervenes in Energy Star and other voluntary activities, as necessary, to shape future regulations or support coordination with voluntary programs.

The new Planning and Coordination subprogram expands the coordination role of the C&S program in the market adoption cycle for energy efficiency technologies and practices. As many of the measures offered through voluntary programs are adopted into the standards, C&S will coordinate both internally and externally to support a dynamic approach to portfolio planning with the objective of accelerating market acceptance and ultimately the adoption of successful, cost-effective technologies or practices into code. C&S will directly support the goals and objectives of both the CA Long Term Energy Efficiency Strategic Plan and the Codes and Standards Action Plan currently under development, subject to budget constraints.

A glossary of acronyms used in this document is provided at the end of the document.

5. Program Rationale and Expected Outcome

a) Quantitative Baseline and Market Transformation Information

Program Performance Metrics (PPMs)

The IOUs have evaluated 2010-2012 PPMs in Resolution E-4385 for applicability to the 2013-2014 program cycle and propose to work collaboratively with Energy Division to develop revised program targets and PPMs as appropriate for the 2013-2014 program cycle. The IOUs' will propose revisions in an advice letter, per additional guidance from Energy Division.

Table 3.1 Short-Term PPMs

On December 2, 2010, the Commission issued Resolution E-4385, approving short-term Program Performance Metrics (PPMs) for Pacific Gas and Electric Company, Southern California Edison Company, Southern California Gas Company and San Diego Gas and Electric Company for 2010-2012 statewide energy efficiency programs and subprograms. The Commission gave each PPM a metric type which indicated the reporting frequency: Metric type 2a indicates that the IOUs should report on the metric on an annual basis (unless indicated otherwise). Metric type 2b indicates the IOUs should report on the metric at the end of the program cycle.

CODES AND STANDARDS		
Building Standards Advocacy	1. Number of Residential and Commercial CASE studies, as defined in Building Standards Objectives 1 & 2 for which adoption by the CEC is anticipated by the IOUs, targeting efficient technologies practices and design in each of the following areas: lighting; HVAC; envelope; water heating; and cross-cutting measures in support of the following: (a) Integrated Design, including data management and automated diagnostic systems, with emphasis on HVAC aspects of Whole Building, (b) ZNE technologies, practices, and design in Residential Sector, (c) Peak efficient technologies including plug loads and HVAC technologies, (d) Advanced Lighting Technologies	2b
Appliance Standards Advocacy	Number of draft CASE Studies, as defined in Appliance Standards Objective 1, developed as mutually agreed upon by the CEC and IOUs in support of plug loads, refrigeration, advanced lighting, and/or other technologies that are adopted by the CEC, within authorized budget.	2b
Compliance Improvement	Number of role-based, Title 24 training sessions delivered.	2b
Reach Codes	Number of jurisdictions in IOU Service territories with CEC approved Reach Codes in residential and/or commercial sectors as a result of the RC sub-program activities.	2b

Table 3.2 Long Term PPMs

PG&E includes long term PPMs[2] per Energy Division guidance received in December 2012. As stated in the Joint Utilities' comments to the Commission in R. 09-11-014 dated November 21, 2011, and discussed between IOUs and ED on January 9, 2013, IOUs plan to finalize long term PPMs in further discussions with involved stakeholders and propose updates to Energy Division at a later date.

[2] From the Energy Division's file "Revised MTIs_10 27 11-formal-release-ED-May-2012.xlsx"

MTI Index#	RE-CATEGORIZED Metric (LTPPM - or SPI) [E-4385 Appendix B original text except for noted edits]	Unresolved Issues
CS-2	MT Indicator 2: Number of utility incentivized EE measures that become part of the following code cycle (e.g. measures incentivized in 2006-2008 would be part of 2011 or 2014 code) targeting the following: a. advanced climate-appropriate HVAC technologies (equipment controls, including system diagnostics) b. Whole Building approaches in Commercial buildings c. Whole House approaches in Residential homes d. Advanced Lighting e. High efficient peak reduction technologies including plug loads f. Other categories	May want to consider simplifying to track specifications of OIU rebated measures that become part of code not specific measures. (i.e. "Number of new measure codes that have the same specifications as incentivized EE Measures")
CS-5	MT Indicator 5: Percent of building departments (jurisdictions) that adopt and use tools identified as industry best practices to improve permit application, tracking, and inspection processes and increase regional consistency.	
CS-8	MT Indicator 1: Number and percent of eligible jurisdictions participating in the compliance enhancement program	

b) Market Transformation Information

Market Transformation Indicators (MTIs)

Per Resolution E-4385, a subset of market transformation indicators (MTIs) for statewide energy efficiency programs and subprograms were presented at a public workshop on November 7, 2011, to allow for public comments and discussion before being finalized. Per guidance from Energy Division received in December 2012, the approved Market Transformation Indicators for 2013-2014 were filed in a Joint IOU matrix as an appendix in PG&E's January 14, 2013 compliance filing.

c) Program Design to Overcome Barriers

The statewide Codes and Standards Program has five subprograms including:

1) Building Energy Codes Advocacy
2) Appliance Standards Advocacy
3) Compliance Improvement
4) Reach Codes
5) Planning and Coordination

Building Code and Appliance Standards Advocacy Subprograms
Codes and standards advocacy comprises a portfolio level strategy that complements incentive and information offerings in several ways. Since IOU incentive and rebate programs typically capture only a small percentage of the market, a transition to regulatory intervention is essential to maximize portfolio energy savings. This transition to code causes a once high-margin product to become an industry standard; thereby reducing the overall cost to society for energy efficiency. This commoditization effect, in turn, spurs innovation for new high-margin products since most manufacturers and other industry practitioners seek to compete in part on high-margin differentiated products.

As involuntary interventions, codes and standards are effective at breaking down market barriers such as split incentives between building owners and tenants that are difficult to overcome through incentive and information programs. Minimum code requirements direct consumers', builder's and renovation contractor's choices of materials and appliances to higher efficiency products, thereby reducing monthly energy bills to tenants. Regulations also improve equity in benefits from IOU customer investments in energy efficiency through rates. Through codes and standards, positive changes initiated through voluntary programs targeting early adopters are extended to all customers. Hence, hard-to-reach groups that do not participate in voluntary offerings benefit through codes and standards.

Baselines for building and appliance advocacy activities are developed in two ways. If the objective of a code proposal is to update an existing standard, the baseline is simply the existing standard. If the objective is a new standard, which expands the scope of building or appliance efficiency regulations, the baseline is established through market characterization studies prior to or during the development of the CASE study unless a recent preexisting market characterization study can be found. Hence, baselines for new standards often do not exist until a draft CASE study is complete.

IOU support for recent CEC code upgrade cycles – in particular, the 2003, 2004, 2006, and 2008 CEC proceedings – for new building codes and appliance standards has significantly increased the rate of change in regulations compared to previous code cycles. Moreover, the scope of regulations has grown to include Title 24 alterations for

measures such as duct sealing when replacing HVAC system components, and numerous appliances have been added to Title 20. These changes have created a significant need to support the successful implementation of the standards by improving industry awareness and understanding of California regulations.

As compliance improvement efforts are carried out to improve the rate-of-compliance -- with building codes or appliance standards, the benefits of the increase in compliance are captured in the Advocacy subprogram savings, as part of the verified C&S program energy savings. Determination of compliance improvement savings requires that program savings be recalculated periodically based on recurring CPUC evaluations of compliance rates.

Compliance Improvement (CI) Subprogram

Compliance improvement is increasingly important to the energy efficiency industry in California. Having supported the commercialization of efficient technologies and practices through IOU incentive and rebate programs, achieving satisfactory compliance is a crucial requirement for capturing market change for the long-term benefit of society. Broad compliance is necessary to level the playing field for well-intentioned suppliers and contractors who are otherwise faced with a competitive disadvantage when complying with regulations. Greater compliance strengthens voluntary program baselines, provides a solid foundation for future robust advocacy efforts, and improves throughput of California's energy efficiency industry by removing an industry bottleneck.

The primary barriers to compliance with the building standards include the complexity of the standards and limited resources available for enforcement by local governments and the CEC. Although education and training are not substitutes for enforcement, they increase compliance rates by generating awareness and improving understanding of regulations, and by equipping key market actors in the compliance supply chain with the tools and knowledge necessary for compliance. The CI subprogram will offer training and resources to market actors throughout the compliance delivery chain, which may include, but is not limited to energy consultants, building department staff, contractors, and design professionals.

In addition, the CI subprogram will work with local government and other industry partners to provide technical support and other resources, such as process improvement tools. The CI subprogram will document best practices and lessons learned from the Best Practices study completed in 2012, and will work with California Building Officials (CALBO), CEC, and local government partners to encourage other jurisdictions to adopt successful practices and tools identified during the pilot project. By encouraging more jurisdictions to use the same or similar processes, tools and forms where possible, compliance will be simpler for market actors, as enforcement will become more consistent.

The CI subprogram supports proactive building departments that seek general improvements to operations and compliance improvement processes. The rationale is

based on the recognition that building departments are facing increased economic pressures and resource constraints, with no reduction in the required workloads. Given that this trend is unlikely to change in the near future, utility assistance in improving the efficiency of building department enforcement processes will effectively provide the jurisdiction with more resources to increase compliance rates. The CI subprogram will identify and create tools to help optimize existing processes and simplify enforcement and work with staff to test and modify the tools as necessary. Tools might include, but are not limited to, electronic forms, tracking software, or implementing online permitting and payment methods.

In addition to supporting the CPUC's impact evaluation, which will involve establishing compliance rates as part of advocacy subprograms, the IOUs will document training and other efforts employed, administer pre- and post-tests to gauge training participants' knowledge swing, and gather and measure implementation of best practices study recommendations in participating building departments.

Reach Codes (RC) Subprogram

The RC subprogram will focus primarily on developing and/or supporting the development of reach codes, or locally adopted ordinances, that exceed statewide minimum requirements. Reach codes are typically codes adopted by local governments and provide a means to test new codes as well as testing the efficacy of increasing the stringency of existing codes at a local level prior to disseminating the code on a statewide basis. Each jurisdiction's experience with local codes can be used to inform the state's process by documenting both the successes and barriers faced for both adoption and implementation. The RC subprogram will encourage local governments to first optimize compliance with existing codes, and will provide training and resources where applicable.

The IOUs have worked with local jurisdictions (cities, counties, school districts, colleges and universities, etc.) to implement a more coordinated approach to development and implementation of local ordinances to minimize market actor confusion. In addition, IOUs have and will continue to promote regionally consistent ordinances where possible to reduce the duplication of efforts that results when individual government entities develop the language and technical supporting documentation independently. This duplication can even occur in regional government organizations whose geographical boundaries aren't consistent with the CEC's climate zone designations. Lastly, coordinated development provides better staging for statewide adoption, leverage for local jurisdictions to encourage adoption, and increases the likelihood of adoption and compliance.

Working with local jurisdictions and other market actors, the IOUs will develop a package of climate-zone based reach codes for new construction as well as some existing buildings. The IOUs will continue to work closely with the CEC to expedite the CEC review and approval process and to drastically reduce local government development costs and facilitate subsequent adoption of the code(s). Reach codes may also include

codes targeting government-owned buildings or particular activities such as commissioning.

The main enabling assumption for the RC subprogram is a continuation of the CPUC policy directive that allows constituents in jurisdictions with local ordinances to participate in voluntary programs without being classified as free riders. The CPUC, along with utilities and local governments recognize that this policy is necessary, especially in light of the long-term strategic policies that must be implemented to reduce California's Green House Gas (GHG) emissions sufficiently to meet statewide reduction goals as set forth by AB32. Otherwise, the effective result "punishes" innovators and market leaders by eliminating access to incentive and rebate programs to assist these leaders in achieving additional energy savings. In most cases, reach codes are adopted based upon the expectation of continuing eligibility for incentives and rebates.

The program assumes that citizens of a jurisdiction or agency that passes a reach code continue to be deemed eligible participants in incentive and rebate programs administered under the auspices of the CPUC, consistent with the treatment of California-owned buildings responding to Governor's Executive Orders (S-20-04 and B-18-12) requiring state buildings to reduce energy usage by 20% by 2015. This interpretation can set up a positive energy efficiency feedback loop wherein participation in incentive and rebate programs increases because of the reach code, and the availability of incentives and rebates to assist code compliance encourages more local governments to adopt a reach code.

Baselines: For new construction (including renovations, additions, and replacements) reach codes, the IOUs assume Title 24 as the baseline. A Title 24 baseline provides a conservative savings estimate, is consistent with new construction incentive programs, and eliminates any potential overlap with the Compliance Improvement savings claims.

Time-of-Sale (TOS) reach codes for existing buildings assume that no energy actions are undertaken absent the code. There are currently only two TOS codes that the program is aware of in California. The scopes are both very limited, and in at least one case, the code is not routinely enforced. Therefore, assuming that building owners do not undertake any energy efficiency retrofits at TOS absent a specific requirement is a reasonable assumption consistent with the rationale for the proposed new construction reach code baseline.

Enabling assumptions include a "shared savings" claim mechanism for attributing savings impacts resulting from reach codes. In a jurisdiction with a reach code, savings resulting from participants in the relevant incentive or rebate program (new construction or retrofit) will be claimed by that program, consistent with current practice. Savings resulting from completed projects that do not participate in an incentive or rebate program will be claimed by either the Codes and Standards or Government Partnership programs if one is extant.

In addition to local governments, various agencies such as school districts, colleges, universities, and industry groups are adopting reach-code policies. Examples include:

- CHPS (Collaborative for High Performance Schools) as adopted by school districts
- Green building requirements adopted by the UC, CSU, and community college districts
- LEED and GreenPoint Rated as adopted by various agencies, builders and jurisdictions
- ASHRAE Standard 189: High Performance Green Buildings, is expected to be adopted by agencies and local jurisdictions

In many cases, the IOUs were involved in the development, adoption, and deployment of these reach code programs. The primary intent of the IOUs involvement was to increase participation in EE programs. The impact of these programs needs to be recognized in the evaluation process as they tend to raise the baseline for code compliance for program participants and non-participants. For example, the baseline for schools in a district with a CHPS policy resolution may have a much higher efficiency baseline as a result of the efforts of the IOU from participation in both the Savings By Design program and CHPS even though there was no legal requirement to exceed the code.

Going forward, the C&S program will be working on the development of new and updated reach code rating systems, standards, guidelines, most of which be based upon the new Title 24 standards. These reach codes are expected to be adopted and implemented with the support of the C&S program by various agencies, institutions, and building associations. Although there have been cases where the mere adoption of reach code programs have little to no impact, there have been a number of cases where significant savings have been verified.

Examples of where verification processes are in place include the CHPS Verified program and the CHPS deployment at Los Angeles Unified School District (LAUSD). The CHPS Verified program (http://chps.net/chps_schools/Verified.htm) provides project review, design review, and construction review of school projects to verify compliance with CHPS requirements. This is a fee-for-service program that provides a rigorous review of the project prior to Department of State Architect (DSA) plan review which generally results in the overall reduction in time and cost for the school design and construction process. In the case of LAUSD, the District worked with consultants (including Global Green) to integrate CHPS into their internal quality assurance process that involved the design teams and all LAUSD design, construction review, and maintenance and operations staff. The C&S program proposes to review these and similar compliance improvement programs and processes and will implement them accordingly to maximize the energy savings associated with the reach code programs.

To the extent that the C&S program is able to increase compliance with these reach code programs, the resulting savings should be reflected in buildings that result in above-code performance. In addition, to the extent that the IOUs were and will be involved with the development and deployment of these reach-code programs, the energy savings should be treated similarly to the reach code ordinances adopted by local government jurisdictions.

Based upon precedents that allow eligibility for above-code incentives for state and federal agencies with executive orders (e.g., Governor's Executive Order (S-20-04, recently replaced by B-18-12) requiring state buildings to reduce energy usage by 20% by 2015) for mandatory above code construction of their buildings, the IOUs propose continuing the policy of treating these reach code policies in a similar manner.

Planning and Coordination Subprogram
The ambitious goals set by the CPUC and CEC require the participation of many different entities. Without proactive coordination, it will be difficult if not impossible to fully realize the savings from the C&S program activities as well as other programs. The C&S program will facilitate coordination and develop and implement a strategic vision to promote and advance cost-effective technologies.

The Planning and Coordination subprogram will work with the CEC, CPUC, emerging technologies, as well as voluntary programs to create a strategic approach for key measures and technologies in support of the Zero Net Energy (ZNE) and other policy goals. For those key technologies, the C&S program will strive to work with other programs to commercialize them for adoption into a relevant code or standard.

The Planning and Coordination subprogram will also work with other programs and market actors to improve code compliance, conduct more outreach and solicit additional input on code enhancement proposals from impacted industries. As part of the expanded outreach and communications efforts, the C&S program will establish and maintain a codes and standards collaborative, and will continue to facilitate the Compliance Advisory Group. In addition, the C&S program will maintain regular contact with state and federal code-setting agencies to minimize duplication of efforts and coordinate activities.

d) Advancing Strategic Plan Goals and Objectives

Through the C&S program, SCG, SDG&E, SCE and PG&E will combine advocacy, compliance improvement and reach code development efforts to meet the codes and standards goals defined in the Strategic Plan in Section 7. Please see Section 6 for the specific action strategies the IOUs will employ in order to meet the Strategic Plan's codes and standards goals.

Due to the long code upgrade cycle, the process of developing CASE and research studies may extend past the end of the program cycle; therefore, funding committed prior

to the end of 2014 will be available for four years thereafter to fund these studies. This might entail moving the committed funds forward into subsequent program cycles until these studies are completed.

6. Program Goals, Objectives and Action Strategies

a) Subprogram Descriptions

The C&S program consists of five subprograms: Building Codes Advocacy; Appliance Standards Advocacy; Compliance Improvement; Reach Codes; and, Planning and Coordination.

1. Building Codes Advocacy Subprogram

   The Building Energy Codes Advocacy subprogram primarily targets improvements to Title 24 Building Efficiency Regulations that are periodically updated by the California Energy Commission (CEC). The subprogram also seeks changes to national building codes that impact CA building codes. Advocacy activities include, but are not limited to, development of code enhancement proposals and participation in public rulemaking processes. The subprogram will coordinate or engage with ratings organizations that are referenced in Title 24; for example, the National Fenestration Rating Council, and the Cool Roof Rating Council.

2. Appliance Standards Advocacy Subprogram

   The Appliance Standards Advocacy subprogram targets both state and federal standards and test methods: improvements to Title 20 Appliance Efficiency Regulations by the CEC, and improvements to Federal appliance regulations by the US Department of Energy. Advocacy activities include, but are not limited to, development of code enhancement proposals and participation in the public rulemaking process (Title 20), and comment letters based on IOU research and analysis (USDOE), participation in direct negotiations with industry, and development of quasi-mandatory appliance standards reach codes. Additionally, the subprogram monitors state and federal legislation and intervenes, as appropriate.

3. Compliance Improvement

   The Compliance Improvement subprogram is a new subprogram that combines the previous Extension of Advocacy and Compliance Enhancement subprograms. It provides education, training, and other activities targeting building departments and other industry actors responsible for compliance with Building Energy Code and Appliance Standards requirements. Activities may include development of "best practices tools" and other infrastructure elements that serve multiple compliance improvement objectives.

4. Reach Codes

   The Reach Codes subprogram provides technical support to local governments that wish to adopt ordinances that exceed statewide Title 24 minimum energy efficiency

requirements for new buildings, additions, or alterations. Support for local governments includes research and analysis for establishing performance levels relative to Title 24 and cost effectiveness per Climate Zone, drafting of model ordinance templates for regional consistency, and assistance for completing and expediting the application process required for approval by the CEC. The subprogram also supports local governments that seek to establish residential or commercial energy conservation ordinances for existing buildings.

5. Planning and Coordination

   The Planning and Coordination Subprogram supports planning activities that improve alignment across the IOU energy efficiency portfolio with respect to future C&S program activities. This subprogram supports efforts to prepare the market for future code adoption (i.e., improve code readiness), to ensure higher code compliance rates and advance the CPUC Strategic Plan goals for achieving zero net energy.

b) Program Goals and Activities

In general, the goals of the C&S program are the same as the two C&S goals defined in the C&S section of the Strategic Plan. Through the Advocacy subprograms, the IOUs will strive to continually strengthen and expand building and appliance codes and standards as IOU efforts reveals greater efficiency opportunities and compelling economic benefits. Through the Compliance Improvement subprogram, the IOUs will strive to improve code compliance through education, outreach, and other technical resources. IOUs will also develop local ordinances and facilitate their adoption and implementation in motivated communities.

- Strategic Plan Codes and Standards Goal #1: Continually strengthen and expand building and appliance codes and standards as market experience reveals greater efficiency opportunities and compelling economic benefits. (Subprograms 1 and 2: Building Codes and Appliance Standards Advocacy).
- Strategic Plan Codes and Standards Goal #2: Improve code compliance and enforcement. (Subprograms 3 and 4: Compliance Improvement and Reach Codes).

The following sections provide a description of the proposed C&S subprogram activities which will lead to achieving the program goals.

Building Codes Advocacy

The Building Codes Advocacy program will continue conducting many of the same activities as were conducted in the 2010 – 2012 program cycle, but will focus on the upcoming 2016 Title 24 Energy Building Code cycle. In addition, the Building Energy

Codes Advocacy subprogram will expand activities at the national level. Primary activities for 2013-2014 include the following:

2013 Title 24 Building Codes

- Support implementation of adopted 2013 Energy Building Code:
  - Complete revisions to compliance manuals and forms.

2016 Title 24 Building Codes

- Prepare CASE studies in coordination with CEC:
  - Conduct research for 2016 building code advocacy to advance State policy goals.
  - Support activities to address Department of Finance review requirements.
  - Research residential ventilation / IAQ requirements to reduce and control. infiltration while maintaining and improving indoor air quality.
  - Research and advocate methods to remove code barriers to the increased use of renewable energy in support of ZNE goals.
  - Support development of 2016 compliance software.

Appliance Standards Advocacy

The Appliance Standards Advocacy subprogram will continue conducting many of the same activities as were conducted in the 2010–2012 program cycle, but will focus on preparing new measures pursuant to CEC's adopted Order Instituting Rulemaking (OIR) for Title 20 Appliance Standards and U.S. Department of Energy's ongoing rulemaking for Federal Appliance Standards. Primary activities for 2013-2014 include the following:

Title 20 Appliance Standards Rulemaking

- Prepare CASE studies pursuant to CEC's adopted OIR:
  - Advocate and provide public testimony in State public proceedings
  - Conduct research and testing and submit supporting market and technical data to the CEC
  - Participate in consensus negotiations with industry and energy advocacy groups (which typically develop standards levels which CEC eventually adopts)
  - Develop voluntary agreements or reach standards

Federal Appliance Standards Rulemaking

- Provide support to DOE rulemaking process:
  - Advocate and provide public testimony in Federal public proceedings.

- Submit supporting market and technical data to the Department of Energy (DOE).
- Participate in consensus negotiations with industry and energy advocacy groups (which typically develop standards levels which DOE eventually adopts).
- Develop voluntary agreements or reach standards.

Compliance Improvement

For the 2013-2014 program cycle, the combines the former Extension of Advocacy and Compliance Enhancement Program activities into one Compliance Improvement subprogram to enhance understanding of program objectivities and activities. The subprogram will strive to improve compliance with Title 24 and Title 20 standards while implementing an effective sector strategy with the Workforce Education and Training (WE&T) Program. Primary activities for 2013-2014 include the following:

Title 24 Compliance

- Title 24 Standards Essentials Role-Based training for building inspectors:
  - Continue delivering training to plans examiners and energy consultants. Update curriculum to cover what is new in the 2013 code.
  - Expand role-based training curriculum to additional compliance improvement market actors such as the building trades and design professionals as guided by needs assessment.

- HVAC Quality Installation and Other Programs with Direct Code Requirements
  - Identify opportunities to insert code compliance modules in existing curriculum, such as training required for technicians.

- Online Compliance Training:
  - Explore training delivery mechanisms beyond the traditional classroom to include live webinars, activity-based online training, and in-field demonstrations.

- Tools and Process Improvements:
  - Implement tools and process improvements as identified through the building department best practices study and the Compliance Improvement Advisory Group (CIAG).

- Forms and Compliance Documents:
  - Support development of improved forms and compliance-related documentation for 2013 Title 24.

- Compliance Improvement Incentives:
    - Explore a pilot project designed to improve compliance by providing incentives to local governments, contractors, or other key market actors. The pilot will be based on the CIAG's guidance and may include nonmonetary incentives such as training or provision of tools designed to streamline the permitting and inspection processes for building additions and alterations.

- Target Low Compliance Problem Areas:
    - Collaborate with the CEC to identify problem areas and potential compliance improvement solutions through white papers developed by CIAG members.
    - Consider pilot project to improve compliance for measures with known challenges, which may include providing incentives to contractors for pulling permits, or motivation for other market actors.

- Develop and Conduct Outreach Campaign to Improve Compliance:
    - Collaborate with the CEC to develop and implement an outreach campaign designed to improve compliance with Title 24 and Title 20 standards. The campaign will be based on the CIAG's guidance and may include activities such as developing flyers for contractors to provide to potential customers explaining the code requirements and benefits, mini measure-based code seminars for big box store employees, etc.

- CEA exam development, facilitation support, and maintenance
    - Collaborate with the California Association of Building Energy Consultants to improve the working knowledge, skills, analytic ability and accountability of individuals using energy compliance software and preparing the appropriate Title 24 documentation for permit submittal. The C&S program will support updating the beta Residential and Nonresidential CEA examinations developed in 2010-2012 to properly test applicant CEAs under the 2013 standards and facilitating the roll out of the new certification process.

Title 20 and Federal Standards Compliance

- Surveys and Technical Support:
    - Conduct surveys and provide technical support to CEC and industry to facilitate compliance.

- Education and Outreach:
    - Collaborate with CEC on implementing an education and outreach campaign targeted to distributors, retailers, contractors, and possibly consumers.

Reach Codes

For the 2013-2014 program cycle, the IOUs will continue to collaborate with the CEC and Local Government Partnership Program to identify, and provide technical assistance to, local jurisdictions interested in adopting reach codes. In addition, the IOUs will continue to collaborate with CEC to provide support for developing voluntary standards to encourage buildings to achieve exemplary performance in the areas of energy efficiency. Primary Reach Code subprogram activities for 2013-2014 include the following:

Reach Code Technical Assistance

- Cost Effectiveness Studies:
  - Prepare Cost Effectiveness studies for each of the California climate zones (to be updated for 2013 Energy Building Code) that have been vetted with the CEC, resulting in expedited CEC review of reach code application submittals.

- Policy Guidelines:
  - Provide a "Road Map" of Policy Guidelines for adopting Reach Code including an overview of some of the implications and important choices in writing and adopting these types of ordinances, and recommendations intended to improve implementation and compliance.

- Ordinance Template:
  - Provide a Reach Code Ordinance "template" that establishes clear definitions of when the ordinance is triggered, including CEC-required language which states that all buildings shall meet all applicable requirements of the Building Energy Code.

- Workshops & Presentations:
  - Facilitate public workshops and presentations to interested stakeholders including elected officials, city staff, industry organizations, and community groups that address the following:
    - Critical role that energy efficiency plays in reducing greenhouse gas emissions
    - Understand how Reach Codes and complementary new construction incentive programs such as the California Advanced Homes (CAHP) program help meet CalGreen's voluntary Tier 1 and Tier 2 Energy requirements, accelerate advancement of zero net energy building practices, and mitigate project-level GHG impacts pursuant to CEQA requirements.
    - Explain the process for developing and adopting a legally enforceable reach code pursuant to CEC requirements
  - Work with industry organizations and other market actors to conduct outreach to local governments to inform them of available reach code assistance.

Local ordinances may be structured in several ways, and often vary in scope, requirements, and triggers. The C&S team will encourage local governments to adopt regionally consistent ordinances where feasible to reduce potential market confusion. However, differing circumstances in each jurisdiction may require them to pursue different avenues. For example, ordinances may be limited to energy issues only, or may be more comprehensive, also including other green building measures. Some examples of typical variations in ordinances include the following:

- Scope and Triggers: Local ordinances may include residential, nonresidential, or municipal buildings, or any combination of the above. Many local ordinance requirements apply to new construction only, while others also include remodels. Triggers may include project size, scope, or value.
- Requirements: Local ordinances typically specify a particular level of performance, allowing builders and designers to achieve the desired performance using a combination of measures and technologies that are appropriate for the project. Many local ordinances specify that covered projects exceed state requirements by a specific percentage (15% was the most common requirement relative to the 2008 Standards). In addition, local ordinances may require projects to meet CalGreen Tier 1 or Tier 2 advanced efficiency levels as well as the non-energy portions of CALGreen. Another common structure employed by many local governments is to require buildings to obtain certification from a relevant green building rating system such as LEED or Build It Green. This structure allows the jurisdiction to leverage the documentation and verification requirements inherent in these systems, thus reducing the verification burden on the building department.

Planning and Coordination (Non-Resource Subprogram)

The Planning and Coordination subprogram supports planning activities that improve alignment across the IOU energy efficiency portfolio with respect to future C&S program activities. The C&S staff will coordinate with IOU energy efficiency portfolio programs to support efforts to prepare the market for future code adoption (i.e., improve code readiness), to ensure higher code compliance rates and advance the CPUC Strategic Plan goals for achieving zero net energy.

This subprogram will consist of four elements: 1) Strategic planning and coordination; 2) Outreach within each IOU to other program areas; 3) Statewide planning and coordination; and, 4) Workforce education and training. Primary activities for 2013-2014 include the following:

Strategic Planning

- Codes and Standards Collaborative:

  - Maintain a Codes and Standards Collaborative to conduct strategic planning.

- Code Readiness:
  - Establish cross-functional teams, including representatives from voluntary programs (incentive, emerging technologies, and education and training), the CPUC, and the CEC, will be established to identify code readiness priorities relative to policy goals, for example: zero net energy, AB 1109, and other Action Plan objectives.

Internal Coordination and Communications

- Periodic Meetings:
  - Conduct a variety of internal coordination activities based on respective needs of each IOU, including periodic meetings with program leads in other areas as well as management teams.

- Ongoing Communication:
  - Inform planners and support groups regarding future code changes, collaboration on evaluation and regulatory matters.
  - Solicit input from other groups re advocacy efforts, aligning education and training activities with incentive programs.

Statewide Collaboration

- Integrated Dynamic Approach to Portfolio Planning:
  - To support the state's zero net energy objectives, the C&S team will work closely with new construction programs to develop an integrated approach to align new construction program offerings with base code requirements as well as reach codes where possible.
  - The C&S team will work with core retrofit programs as well as local government partnerships and third parties to coordinate offerings with anticipated code changes.

- CPUC Communication:
  - Conduct monthly calls with CPUC personnel to share progress and discuss issues.

- CEC Communication:
  - Maintain statewide weekly calls with CEC staff regarding building codes and appliance standards.

- National Stakeholders Communication:
  - Conduct regular conference calls with national stakeholders regarding appliance standards.

- Compliance Advisory Group Communication:
  - Host quarterly meetings with Compliance Improvement Advisory Group regarding compliance improvement activities.

- Local Government Partnership Communication:
  - Provide quarterly updates to Local Government Partnership Program regarding reach code adoption progress and delivery of training to building departments.

Workforce Education and Training (WE&T)

- Sector Strategies for WE&T:

  The C&S and WE&T teams will meet periodically to coordinate activities that will enhance support for the appropriate market actor roles responsible for new and emerging codes and standards implementation according to priorities established by needs assessments. The C&S program will collaborate with the WE&T Centergies subprogram to not only prepare contractors and technicians to implement current codes, but to also prepare them with technical training on advanced technologies that are projected to become part of reach codes and then the statewide code.

c) Program objectives (more specific milestones to be achieved to accomplish the goals)

See Codes and Standards Alignment with Strategic Plan narrative and table below.

d) Program action strategies that will be used to implement the goals

See Codes and Standards Alignment with Strategic Plan narrative and table below.

e) Program outputs (measurable results of the program linked to the action strategies)

See Codes and Standards Alignment with Strategic Plan narrative and table below.

Codes and Standards Alignment with Strategic Plan

The following narrative and table details the specific actions the C&S program will use to carry out the C&S goals defined in the Strategic Plan and the program outputs linked to each action strategy.

In addition to striving to meet the two C&S goals defined in the Strategic Plan, the IOUs will work in concert with other programs within the energy efficiency portfolio to help

meet associated goals such as those defined for HVAC, local governments and WE&T as described in Section 8 of this PIP.

Strategic Plan Codes and Standards Goal #1: Continually strengthen and expand building and appliance codes and standards as market experience reveals greater efficiency opportunities and compelling economic benefits. (Subprograms 1 and 2: Building Codes and Appliance Standards Advocacy)

The C&S program will provide a direct response to the CPUC's goal by specifically addressing each near-term strategy in the Strategic Plan. Through the advocacy activities, the program will:

- Continue to expand Title 24 Building and Title 20 Appliance Efficiency Regulations through improved research to identify current code and compliance shortcomings, new technologies and processes, and latest thinking on breadth (scope) and depth (stringency) of possible standards
- Develop aggressive proposals to accelerate regulations for both Title 20 appliance efficiency standards and Title 24 building standards
- Support leading activities such as statewide reach standards (e.g., codes that include California Green Building Standard) and the coordinated development and adoption of advanced local government ordinances.
- Coordinate with both internal and external organizations on an ongoing basis, including voluntary programs and national standards organizations

The Strategic Plan outlines five strategies to strengthen and expand building and appliance standards. The C&S program intends to address each strategy through the advocacy subprograms as follows.

Strategy 1-1: Develop a phased and accelerated approach to more stringent codes and standards.

The C&S program seeks to accelerate the adoption of increasingly stringent building and appliance standards. To this end the program will develop proposals to increase the scope and stringency of Title 20 and Title 24. The C&S program will also develop or support development of more stringent codes, such as the California Green Building Standard, ASHRAE Standard 189, and other model code ordinances, which would significantly exceed the current Title 24 requirements and could potentially become a model for local green building ordinances.

The use of discrete, above minimum code tiers of efficiency standards (e.g. reach codes) have been proven to be an effective way to promote energy efficiency, prepare the market for high efficiency equipment in an orderly way and smooth the transition for more stringent future standards. However, the proliferation of many standards for the same product renders confusion in the market place and hinders compliance. The C&S

program will work with local governments that currently have or are considering adopting advanced energy codes to identify common themes among their primary objectives and develop a set of model reach codes and standards that form the path for subsequent statewide adoption. The C&S program will help local governments improve compliance by developing compliance forms, modify performance software, and provide code compliance training to practitioners and building departments

Historically, approximately 100,000 single family (SF) homes and 50,000 multi-family (MF) dwelling units are constructed each year. Estimated construction for 2009 is projected to be much lower: SF 30,000 SF units and 33,400 MF units.[3] These buildings are within the scope of the Title 24 energy code. There are about 8 million existing single family homes and 4 million existing multi-family dwelling units in California.[4] Since homes are sold on average every seven years in California[5], approximately 1.4 million existing homes and (assuming same turn-over for rental properties) 570,000 existing multi-family units are sold each year. Thus requirements for the most basic efficiency measures (attic insulation, weather sealing) installed at time of sale would have a huge impact – potentially impacting 10 times as many residential buildings as do the current residential standards. The C&S program will work with local governments to identify existing barriers and develop model time-of-sale (TOS) requirements such as Home Energy Rating System (HERS) audits, and commissioning for commercial buildings that do not unnecessarily hinder real estate transactions or financing. Ultimately, if the pilot program with local governments is successful, it will make the case for a statewide time-of-sale requirement.

HVAC. The efficiency of heating and cooling systems is central to building energy efficiency standards and has become an even more significant component of the standards through the adoption of time-dependent valuation. Energy losses from ducts can be a large fraction of heating and cooling loads. The Title 24 standards have mandatory requirements for duct sealing and prescriptive requirements for duct testing and verification by a HERS rater. Feedback from duct tests to HVAC contractors and home builders is a very important mechanism for transforming the market. Thus, the C&S program will be pursuing the concept of mandatory requirements for duct testing and self-certification of the test while still including the prescriptive requirement for a HERS rating. Similar to the acceptance tests in the nonresidential market, a self-certified duct pressurization test would be required for all residential duct systems in unconditioned spaces that are not obtaining a HERS verified duct test.

[3] Construction Industry Research Board, California Construction Review, Private Building Construction, January 22, 2009.
[4] http://www.dof.ca.gov/HTML/DEMOGRAP/ReportsPapers/Estimates/E8/E-8.php
[5] Median duration at residence is 7 years for homeowners and 1 year for renters. Jason P. Schachter and Jeffrey J. Kuenzi. US Census. Seasonality of Moves and The Duration and Tenure of Residence: 1996, data extracted from Figure 4. Duration of Current Residence by Current Tenure: 1996.
http://www.census.gov/population/www/documentation/twps0069/twps0069.html

The systems not receiving HERS duct sealing verification would receive the same energy penalty in the performance approach and the systems would not be allowed in the prescriptive method approach. This requirement would reduce enforcement uncertainty – every duct system would be required to be tested. Since all duct systems are required to be tested, this lowers the incremental cost barrier for a HERS verified duct test and assures that mechanical contractors and homebuilders receive the feedback from duct testing on every job. This same approach would be taken for relatively new requirements for measurements of airflow, fan power, duct pressure drop and refrigerant charge.

The C&S program will prepare CASE studies to evaluate the cost-effectiveness, market status and availability of the equipment to determine the potential for revising the building efficiency standards so they are based on enhanced efficiency HVAC systems such as: radiant cooling with a dedicated outside air system, evaporative condensing, direct/indirect evaporative cooling and ground coupled heat pumps. These and other cooling technologies have the potential to be significantly more efficient than the federal air conditioning regulation but may be exempt from federal pre-emption. For federally-regulated cooling equipment, the C&S program will continue working with the federal DOE to develop regional air conditioning standards that would be more appropriately suited to California's warmer and drier climate.

Envelope performance testing. Similar to the requirements for performance testing of HVAC installations, the performance testing of the envelope of homes and other residential dwelling units provides direct feedback on the level of infiltration. Thus, testing could transform the building industry. The C&S program will evaluate the feasibility of adding mandatory requirements for blower door tests for all new homes. Similar to the requirements for duct testing, the prescriptive baseline would retain the HERS verification requirements, but for those homes wishing to avoid the HERS requirements through a performance trade-off the blower door test would still have to be performed.

Strategy 1-2: Expand Titles 24 and 20 to address all significant energy end uses

The C&S program will pursue additional energy savings by broadening the scope of the Title 20 appliance standards and the Title 24 building efficiency standards. Title 20 proposals will be developed and supported through the public stakeholder process for both current and future proceedings. Current proposals include: battery chargers, portable lighting fixtures, set top boxes, televisions, computer monitors, game consoles. Future proposals will include office equipment and other miscellaneous and plug loads. Integration activity with voluntary codes and program activities will be increased to expand potential for new product categories to be added to the measure list. The C&S program will continue to support the Title 20 proposals after their adoption by providing ongoing technical assistance to the CEC to fend off post adoption maneuvering by oppositional stakeholders, which has increased in recent years. This will reduce post adoption exemption of product classes.

For the 2008 revisions to Title 24, the C&S program successfully proposed a bold increase in scope to include refrigerated warehouses. For 2013, the C&S program again advocated increasing the scope of the standards, this time to include the refrigeration plant small walk-in refrigerated coolers and refrigerant plants serving display cases in supermarkets. The C&S program is also pursuing other opportunities with computer room cooling, and other process measures such as compressed air systems.

In the past, energy codes have focused only on the efficiency of the equipment installed and not on how that equipment functions, and recent field studies have found that a significant number of controls do not work correctly. Thus the C&S program will be reviewing the efficacy of fault detection and diagnostic (FDD) controls to determine their effect on operators taking subsequent action to correct the problem when notified. The C&S program will also investigate barriers to submetering tenant units and major building energy consuming systems such as lighting, chiller plants, and boiler plants. Pending approval from the CPUC that water savings are within the scope of IOU energy and resource conservation programs and should be pursued, the C&S program will research requirements for water meters on all new buildings.

With the current federal administration's focus on energy efficiency we can expect, at a minimum, more opportunities to increase the stringency of Title 20 standards though Federal proceedings. If the new administration increases the budget for DOE staff, we can expect an even greater acceleration in activities than the already rapidly increasing number of DOE proceedings. Increased DOE funding would provide the opportunity for states to petition DOE for new rulemakings and/or waiver petitions in support of California energy savings.

The C&S program will work in conjunction with national organizations to align California's reach goals with LEED, Green Globes, and CHPS. Ideally, satisfying California's Green Building Standard would become the minimum threshold to apply for a LEED rating. Likewise, the C&S program will work with ResNet and California HERS Providers on the development of further home rating system upgrades and rating techniques.

Strategy 1-3: Improve code research and analysis.

Research and analysis is the basis of upgrading energy codes. In some cases this research is forward-looking and identifies technologies that have sufficient market experience, cost-effectiveness and broad applicability to be deemed "code-ready." This research can also be retrospective for two major categories of energy savings opportunities:

1. Review of code proposals that were unsuccessful in past code cycles, but appear to have promise due to changes in the market, refinements in the technology or new information.

2. Evaluation of current standards for loopholes, inconsistencies, enforcement barriers. The savings from these issues can be substantial and must be actively researched.

More generally, the program will seek to improve C&S advocacy by developing new approaches to determining incremental costs, availability, and reliability. In particular, cost information is considered confidential by industry representatives who generally oppose code upgrades, so the success or failure of a standards proposal often turns on the perceived accuracy of incremental costs.

Due to the increasing complexity of the targeted measures and increasing sophistication of oppositional stakeholder tactics during the public process under both Title 20 and 24, a greater emphasis on more thorough market research, product performance measurement and technical production data is necessary. Existing studies may be expanded, new studies may be designed and implemented, and additional market research may be purchased to facilitate future standards development. New or updated test methods are required to pursue significant savings opportunities left stranded by current incomplete test methods (e.g., high temperature performance metrics for cooling systems and variable speed capability of commercial refrigeration equipment).

Codes research also needs to consider more than just technologies but also design methods. A "big bold" research topic for Title 24 is a whole building approach to building design. This concept is in support of a requirement for compresssorless or "hybrid" cooling systems in the homes in the more temperate California climate zones. Well-designed homes in the mild coastal regions of California do not need air conditioners. These homes often have thermal mass to dampen the diurnal temperature swings when it is hot outside, so the thermal comfort of the home isn't solely dependent on the air temperature of the home, but also the radiant temperature. The C&S program will pursue the potential of providing Title 24 compliance credit to homes that do not have air conditioners as long as it can be reasonably expected that occupants in these homes will be comfortable enough that these homes will not be retrofitted with air conditioners later on. This approach would likely require an enhancement of the existing performance method simulation tools, or require newer simulation tools such as Energy Plus, that has a thermal comfort model. This would require a significant investment in resources. However, if this concept were implemented, it would move new homes in coastal regions significantly closer to the 2020 zero net energy goal.

This same concept can also be applied to commercial buildings with greater attention given to comfort due to tasks being conducted in fixed positions and locations, and greater attention to internal heat gains resulting from plug loads and lighting loads. However, better thermal mass and comfort models will advance low energy commercial buildings as this would also benefit the characterization and ultimately the design of passive solar commercial buildings assisted with radiant heating and cooling. Energy Plus also promises the capability of modeling airflow which should provide improved

confidence in specifying two other low energy HVAC systems: positive displacement ventilation and natural convection.

Initially, advanced tools require advanced users. Thus training in low energy design principles and methods of predicting building performance training is needed for the next generation of architects and engineers starting out in practice and currently attending California architecture and engineering schools. Training is needed in a number of different venues: for existing practitioners, training opportunities at utility training centers, and at professional conferences. Student training would be most efficiently conducted as part of their normal curriculum. Sponsored curriculum development and sponsored research in the design of efficient buildings results in career long impacts when combined with other broader society-wide incentives for low energy design.

Even more advanced interfaces to these tools expand the scope of potential users by simplifying the user's inputs, but requiring sufficient detail in the nomenclature used by designers so these tools can predict the energy impact of design choices with reasonable levels of accuracy. These program interfaces must have enough flexibility so the breath of applications is wide enough to affect a sizable portion of the possible building applications and the scope of measures is sufficiently broad. Training is still needed for these simplified tools but is accomplished in less time and is given to more people as there are more people likely to use the tool. Easier to use tools expands likely users to sales people, manufacturer representatives and facility managers.

In addition to the fairly sophisticated tools to support these advanced designs, a segment of the market will be drawn to design approaches that are formulaic. These approaches may not optimize energy savings, but if the prescriptive cookbook method is well designed, they can yield significant levels of reliable savings. This requires a significant effort in exercising the design tools, comparing the simulated results to actuals and synthesizing the results into design standards. These design patterns then must be transmitted in a number of ways including resource documents, training materials and presentations.

The energy consumption of buildings is not purely a function of their components but is impacted by occupant behavior and actual equipment installation and performance. Field studies are an important method of feedback on how much energy is really saved by a measure. In some cases this research can leverage information from CPUC EM&V studies and CEC load forecasting studies.

Another significant source of market and technology data is the utility energy efficiency programs. The C&S program will periodically poll the program managers for information concerning market share, technology cost and verified energy savings. The energy efficiency programs will likely identify technologies that may be ripe for code adoption and can help develop the market experience that differentiates those products that are truly code ready.

The importance of the statewide utility Emerging Technology (ET) program will increase as source of information and potential measures for voluntary reach-code tiers. Although available in the market, the measures that are assessed in the ET program may be neither cost-effective nor fully applicable for mandatory standards. In some cases, it may be appropriate to have measures simultaneously included in utility energy efficiency programs as well as a reach code tiers.

Also related to field studies are process evaluations of how the code is administered from the designer and specifier, to Title 24 analyst, to plan check, to bidding, through construction to inspection to occupancy. The delivery of efficient buildings relies on each step of this process. Transferring this information to the CEC and code proposal developers increases the likelihood that compliance will increase with the next energy code.

Strategy 1-4: Improve coordination of State energy codes and standards with other state and Federal regulations.

The development of the California energy efficiency standards does not occur in a vacuum. Much of the technical basis of Title 24 rests on consensus standards developed by ASHRAE (American Society of Heating, Refrigerating and Air-conditioning Engineers) and IESNA (Illuminating Engineering Society of North America.). The measurements of product properties rely on test standards developed by DOE; American Society for Testing and Materials now referred to as ASTM International (ASTM); Air-Conditioning, Heating and Refrigeration Institute (AHRI); National Fenestration and Rating Council (NFRC); Cool Roof Rating Council (CRRC). Although the C&S program works most closely with the CEC, other California state agencies are also involved with the development of efficiency standards. Examples of coordination with other state agencies may include, but are not limited to, the California Air Resources Board (CARB) as codes relate to greenhouse gas (AB 32) and other emissions, Department of Toxic Substance Control (DTSC) as codes relate to toxic waste from lamps, and California Department of Water Resources (DWR) as codes relate to the water use in HVAC systems. In addition, there is much to be learned and many benefits derived from coordinating with ASHRAE and other states that are developing their own energy codes. Thus, the C&S program will be coordinating with other entities in the development of test standards and other consensus standards.

The C&S program will also participate in the development of other standards that can then be applied in California. The most notable of these is the Federal appliance efficiency regulations and international standards, which are likely to have bigger impacts on Federal and state appliance standards in the future. If the C&S program continues to influence the outcome of these regulations, nominal savings in California will be achieved. Since the Federal regulations apply to all sales in the US, compliance enforcement is easier. The program will continue to take a leadership role in advocating for new legislated standards (often based on Title 20 standards in the past) and in both negotiated and contested DOE appliance standards rulemakings. In view of the increasing

international coordination in the codes and standards arena, the program will take a more influential role in influencing international test methods and standards framework developments where there is significant opportunity to affect federal and CA appliance standards. We fully expect the need to travel to other countries to conduct effective collaboration and coordination of standards activities that potentially affect California. Increased coordination with national voluntary program frameworks including CEE and ENERGY STAR are also likely to increase codes and standards efficacy.

Federal appliance efficiency standards limitations have been a hindrance to more stringent codes in California. These Federal standards preempt the state from requiring additional labeling, higher appliance efficiency standards, and prevent building efficiency standards from requiring higher efficient equipment than equipment that are minimally compliant with the Federal appliance standards. Given that the Federal regulations cover the largest energy consuming devices (lighting, air conditioners, and water heaters), this has seriously constrained the effectiveness of California's appliance and building efficiency standards in California. The C&S program will be developing a research plan to address Federal pre-emption including, but not limited to, waiver petitions, federally legislated standards, and development of new coalitions.

The CARB's proposal in response to SB 97, which requires rules be developed to address the California Environmental Quality Act (CEQA) requirements for greenhouse gas emissions, expands the possible scope of energy consumption that could be regulated. Well-defined efficiency measures and performance trade-off options would be in the interest both of CARB and the entity submitting a new industrial, commercial or residential project.

In addition to the coordination with the DWR for the water use in HVAC systems noted above, there is an ongoing CPUC proceeding to determine the amount of energy embedded in water use. Therefore, the C&S program will further coordinate with the DWR as studies are initiated to examine potential reductions in water use. Since the CEC was given jurisdiction over water use starting in 2008, it is anticipated there will be new sections in Title 24 regulating the use of water.

Also as mentioned earlier, the C&S program will pursue developing reach codes in coordination with the California Green Building Standards. To do this the C&S program will coordinate with the BSC (Building Standards Commission), the CEC (California Energy Commission), HCD (Housing and Community Development), OSHPD (Office of Statewide Health Planning and Development), Local Governments, and others.

Strategy 1-5: Improve coordination of energy codes and standards with utility programs

Coordination between C&S and other utility programs may occur in various ways: existing or newly adopted standards, future standards, direct linkages between incentive programs and a specific standard, and long-term integrated planning. This is a rapidly

evolving area, so planning is necessarily at an objectives level for now. The C&S team will periodically meet with other utility program staff to facilitate ongoing coordination.

Newly adopted standards. On an ongoing basis, C&S team communicates with IOU incentive program managers regarding potential adoptions of new standards. Depending on the opportunity, program managers may decide to provide incentives for measures in advance of the effective date to prepare the market.

Education and training between adoption and effective dates of a particular standard represents another way to prepare industry. The C&S program will provide Title 24 training to both market actors and internal program staff in advance of the effective date for the Title 24 Standards. The training will help identify opportunities for ongoing coordination between incentive programs and C&S activities. Another activity under development is to require program participants to complete and submit the applicable acceptance tests required by Title 24 to receive an incentive for HVAC and lighting controls equipment. This will increase compliance with the acceptance tests and help assure the incented equipment is installed according to code intent.

Although all utility programs are impacted by codes and standards, particular focus will be placed on coordinating with the Local Government, HVAC, and WE&T programs. Please refer to Section 8 for how the C&S program will coordinate efforts to help meet shared goals defined in the Strategic Plan.

Future standards. Having selected topics for potential CASE study proposals for the next code cycle, for example, 2011 building and appliance standards, energy efficiency program managers may be able to include measures in programs to improve code readiness. The C&S program may also work with statewide ET program staff to identify new technologies for which to develop alternative calculation methods (ACM). CASE studies can be developed for new technologies to propose Title 24 credit towards achieving compliance, thereby reducing one barrier to market acceptance. Moreover, a Title 24 ACM provides an approved method for calculating energy savings for incentive programs.

The C&S program will continue to improve coordination with the statewide new construction programs. Since the success of these programs are dependent on exceeding the current Title 24 codes, they serve as a useful "test-bed" to inform the development of future Title 24 proposals by highlighting the more cost effective measures, flagging problem areas with compliance, and demonstrating the extent to which the current code can be exceeded.

On a longer term basis, it is sometimes possible to identify code objectives two code cycles into the future. This will be particularly critical for developing an appropriate trajectory for reaching the Strategic Plan's zero net energy goals, AB 1109 Huffman Bill

goals[6], and state policy initiatives indicated in the previous section. For these opportunities, the C&S program will complete a gap analysis to identify distance between code readiness attributes and the current market status of the technology, which will inform the creation of an integrated long-term coordination plan. Long term information repositories may be developed to collect information that will support adoption in a future code cycle.

Direct linkages. The C&S program seeks to directly link, as has been done for the current Title 20 television proposal before the CEC, code proposals with incentive programs. When faced with industry resistance, this linkage constitutes a stronger argument before the commission. Moreover, linking a standard with an incentive program creates a synergy in which the push of a widely recognized future standard reinforces the pull of near term incentive programs, thereby increasing participation in a complementary incentive program.

Albeit weaker compared to direct linkages, the synergy between standards and incentive programs exists more generally through indirect linkages.

Strategic Plan Codes and Standards Goal #2: Improve code compliance and enforcement. (Subprograms 3 and 4: Compliance Improvement and Reach Codes)

The C&S program is committed to improving code compliance and enforcement. To demonstrate this commitment, C&S is expanding the CI subprogram. The program will leverage existing, and develop new education and outreach activities to equip both building and appliance industry market actors with the knowledge and tools needed to comply with Title 24 building energy efficiency standards and Title 20 appliance efficiency regulations. Expanding the program to include compliance improvement will help ensure that the full potential of the state's codes and standards efforts are realized, and results in a comprehensive C&S program.

The C&S strategies and activities listed in the Strategic Plan are focused primarily on Title 24 building energy efficiency standards, noting that appliances are principally regulated at the federal level rather than the state level. As the CPUC Strategic Plan also notes, there remains huge potential savings at the state level for appliances and equipment not regulated by the federal government. With this in mind, the C&S program has added activities to capture Title 20 compliance savings as well and added a sixth implementation item for this program cycle in the Strategic Plan Table below to document planned Title 20 efforts.

Strategy 2-1: Improve code compliance and enforcement.

[6] AB 1109 Huffman directs the CEC to implement strategies to reduce residential lighting by 50% and commercial and outdoor lighting by 25% by the year 2018.

The Strategic Plan identifies one strategy and five activities targeted to improve compliance and enforcement with Title 24 building energy efficiency standards. Each activity is addressed in order below.

Activity 2-1 a): Conduct research to determine high-priority tactical solutions for code compliance and focus efforts accordingly.

As a first step in launching compliance improvement efforts, the C&S team interviewed the building industry market actors included in the compliance supply chain to determined how their current performance compares to the desired performance, the reasons for the gap, and which performance improvement solutions the C&S program may employ to improve code compliance. Additionally, the team interviewed experts who have been providing training, software and regulatory support to industry practitioners over the years to identify best practices, possible points of collaboration and gaps the C&S program can help fill. Furthermore, the C&S program conducted a best practices study with several local governments to investigate code enforcement processes in detail, identify opportunities to streamline enforcement practices and improve consistency across jurisdictions. Results of these research efforts are informing the total package of performance improvement solutions the program will implement to help improve code compliance rates. In addition, the program will work with building departments and other compliance stakeholder to implement recommendations proposed by the Compliance Improvement Advisory Group.

Activity 2-1 b): Increase training and support for local building code officials.

Building code officials are the primary key to improving compliance with Title 24 standards and certain Title 20 regulations such as residential air conditioning equipment. Building department personnel must enforce several different building codes simultaneously, with limited resources. Given the limited time available, officials correctly prioritize those codes related to life-safety, which often results in extremely limited time and resources dedicated to enforcing energy-related codes. In addition to resource limitations, energy codes have undergone much more significant changes in each of the recent code updates than most other codes, thus creating a challenge for officials to maintain their expertise.

The CI subprogram will focus a significant percentage of the code education resources on providing training and support to building code officials. Based on research results, the CI subprogram will develop role-based training courses and abbreviated code guidelines for plan checkers, inspectors and counter staff specifically targeting only those sections of the code related to each particular position. This work will be closely coordinated with the CEC and third party efforts to ensure that it supports and is in alignment with the CEC's compliance improvement efforts.

In addition, in response to the needs assessment to be conducted as part of the building department best practices study, the CI subprogram will develop and test process

improvement tools, and will work with CALBO, the International Code Council (ICC), and CEC to conduct outreach to other jurisdictions to encourage adoption of those tools. The CI subprogram will conduct outreach and encourage other jurisdictions to adopt tools and processes that help building officials increase compliance. The CI subprogram will support more consistency across jurisdictions, in processes, documentation requirements and enforcement practices, and will encourage the expansion of submitting online permitting paperwork for HVAC replacements as well as other measures. These online submittals allow for the creation of customized inspection checklists that also simplify enforcement.

The CI subprogram will also work with the CEC and HERS providers to ensure the new HERS documentation and data management systems are consistent and serve to streamline the compliance process.

Activity 2-1 c): Investigate regulatory tools such as licensing/ registration enforcement.

Currently, although Title 24 documentation must be signed by a licensed professional, the actual calculations can be prepared by anyone. Anecdotal evidence from rebate programs and building departments indicates that the lack of training and/or professional certification requirements results in sub-par documentation being submitted to building officials, thus requiring more time to review documents and determine compliance. The CI subprogram will work with the California Association of Building Energy Consultants (CABEC), CEC and CALBO to increase the stringency of the Title 24 Certified Energy Analyst test, initiate a certification process for Title 24 consultants, and begin requiring energy education for building officials as part of CALBO's existing continuing education requirements.

The CI subprogram will also work with the CSLB (California State License Board) and the DCA (California Department of Consumer Affairs) to conduct outreach to members regarding the importance of the standards to the state and to their customers, and to encourage the CSLB to enforce the HVAC permitting requirements with their members.

Activity 2-1 d): Evaluate proposed changes to the code and compliance approaches to simplify and expedite compliance.

Feedback from building officials indicates that they are overwhelmed by the volume, complexity, and rapid changes to the energy codes. As a complement to the role-based training, the CI subprogram will work with industry experts, CEC, and building officials to develop and test role-based and context-sensitive code guidelines. The guidelines will target specific compliance items and common measures that must be addressed at each stage in the permitting and inspection processes.

The CI subprogram will conduct research to identify specific areas of the code that can be simplified by reducing the number of trade-offs and compliance options and/or transitioning to a greater number of mandatory measures.

In addition, the CI subprogram will work to increase the availability of online permitting resources and the consistency of requirements and documentation across all jurisdictions, with an initial focus on geographically contiguous regions. Online permitting makes obtaining permits more convenient and less costly, and geographic consistency provides a more stable and easier-to-understand process for building designers and contractors, as well as building officials.

Activity 2-1 e): Work with local governments to improve code compliance, adopt above code ordinances, and provide training/education.

The primary goal of the compliance improvement subprogram elements is to improve code compliance. As discussed in activities a) through d) above, CI subprogram will be dramatically expanding and enhancing efforts in support of this goal, launching several different outreach and training offerings and activities.

The C&S RC subprogram has adopted a demand-side philosophy to local code adoption, consistent with the general philosophy of energy efficiency. California has a very robust energy efficiency code that can, if fully enforced, result in a tremendous amount of savings and reduction in both energy usage and peak demand. The RC subprogram will continue conducting outreach to local governments and green communities through Government Partnerships Programs, Build It Green, and others industry partners to educate interested participants about the potential savings that could be realized through optimizing compliance with existing codes prior to adopting a new code. The RC subprogram will inform local governments that optimizing compliance with existing codes is one of the most immediate and significant steps a city or county can take toward reducing the jurisdiction's carbon footprint, and will request a commitment from each participant to take documentable steps toward that end.

Many local governments, in their eagerness to take action in the absence of federal leadership, have individually developed and adopted unique local codes to reduce the climate change impacts of the building activities in their jurisdictions. Unfortunately, codes are developed and adopted without any real overall coordination with other jurisdictions, resulting in a plethora of local ordinances and code requirements throughout the state that are changing frequently, making it impossible to easily track what code applies in which jurisdiction at any given time. The RC subprogram will encourage local governments to work with neighboring jurisdictions to adopt consistent requirements and to remain consistent with current Title 24 climate designations to reduce potential market confusion.

One of the RC subprogram goals for local codes is to promote consistency with the current Title 24 climate zone structure, with which market actors are used to working. The RC subprogram will work with local government partners to identify and document their objectives for a local code and also with the CEC and Building Standards Commission (BSC) to make the next generation of the State's Green Building Standards

meet those objectives for most, if not all local governments. First, the RC subprogram will work with local governments to support development of a package of cost-effective local energy codes that exceed Title 24 minimum requirements for residential and nonresidential new construction. The RC subprogram will support efforts to obtain CEC pre-approval to simplify the approval and adoption process at the local level. In addition, to begin harnessing the tremendous savings potential from existing homes, the RC subprogram will support development of a package of standards that are applicable at time-of-sale or major remodels. Local ordinances will serve as an opportunity to test the efficacy of the codes and inform regulators as to the readiness of the codes for statewide adoption.

Activity 2-1 f): Conduct outreach and education efforts to improve compliance with Title 20 Appliance Standards.

The IOUs' experience working with industry actors on Title 20 advocacy indicates that there are two primary paths for equipment covered by Title 20 to move through the supply chain from manufacturers to consumers. The first is via manufacturers, distributors and contractors, while the second is via retailers directly to consumers. Similar to the Title 24 outreach, the IOUs plan to target each actor in the supply chain for selected measures with significant savings potential and for which compliance rates are relatively low.

Given the wide range of industries and the organization of their distribution channels, compliance improvement activities for appliances will be conducted on an industry-specific basis. For example, compliance improvement outreach for manufacturer-dominated industries logically begins with manufacturers since top down efforts will affect most product sales in California. If major manufacturers are located overseas, as is the case of consumer electronics for example, we fully expect the need to travel to other countries to conduct effective outreach and training.

Different approaches will be used to educate and train retailer-dominated and contractor-dominated industries. In the retailer-dominated case, for example, compliance efforts must target the stocking practices of these retailers. In the contractor dominated case, where contractors are largely responsible for the purchase and installation of the product, compliance efforts must focus on outreach to contractors.

The C&S program will coordinate with the CEC to conduct outreach to equipment manufacturers to inform them of existing code requirements, and to facilitate their compliance from both a technical and administrative perspective. Assistance will be provided to manufacturers to support their efforts to ensure equipment sold in California meets the minimum technical requirements, and to successfully complete the certification process with the CEC.
For measures such as pool pumps, where most are sold through distributors and installed by contractors, in addition to working with the pump manufacturers, the program will work directly with distributors to educate their representatives. The IOUs will also

conduct outreach to contractors directly, and will work with trade organizations to leverage their existing communications networks. Outreach activities may include attending trade conferences and regional meetings, authoring articles for industry newsletters or publications, or direct contact via email or printed materials.

Other measures, such as incandescent lamps and consumer electronics are often purchased directly by consumers through retail establishments. Though the market actors are different for these measures, the C&S program will use similar methods to reach as many market actors as possible. Trade associations are expected to be important stakeholders in this effort and will be leveraged as much as feasible. The IOUs will coordinate with regulators and other providers to identify gaps and opportunities to collaborate.

7. List of Measures & CASE Studies

Following are tables of possible IOU CASE study topics. For a number of reasons, these lists are not static. After further planning, IOUs may decide to swap leads, co-fund, or make other changes, as appropriate. During the CASE study development process, it is sometimes found that there is insufficient market data or economic information to justify a standard. During rulemakings, industry representatives may inject sufficient uncertainty to derail a proposal. The CEC may indicate that they are more interested in some proposals and delay others. Sometimes new ideas occur that were overlooked during the planning process.

The CASE study projects develop feasibility and cost-effectiveness evaluation for a variety of code improvement opportunities. These CASE projects are not a purely technical exercise, advocacy is an important part of moving an idea into energy codes and this requires a significant amount of consensus building and negotiation.

Table 6 includes a preliminary list of measures from the CEC to be evaluated for the 2016 Title 24 Building Efficiency Standards cycle. These will inform IOU planning.

Table 6: 2016 Title 24 Building Codes - Preliminary Measures

2016 Title 24 Preliminary Measures	
Preliminary Nonresidential Measures	
Measure	Description
Flicker specification for all dimming systems	Flicker is a function of the lighting source (ballast, driver) and the dimming control
Task/ambient lighting for offices	
Low W/sf HVAC systems	Prescriptive performance-based requirement, cap on total installed watts.
Optimized Window Area, Update Window VT's	Reduce WWR from 40% to 30% while maintaining visual comfort. Estimate that 0.11/WWR reduced VT reduced daylighting savings by 25%. See ASHRAE ECB reduced

	WWR by building type.
Nat ventilation, dedicated O/A, + chilled beam or radiant system	Drive down fan energy. Window sensors interlocked with fan system
Dual path approach PV vs High Eff HVAC	Base case has 1W/sf of roof area, alternate has high eff HVAC
Eliminate reheat	Through zoning of systems or designs such as dual duct design, reheat can be mostly eliminated.
Daylighting control dimming plus off.	Ballasts can use 20% of power when fully dimmed. In primary zone no light can be needed much of the day. Added savings.
Opaque envelope U-factors	ASHRAE roof values are significantly lower
Retail lighting including occupancy controls	Fix general lighting in tailored method. Further LPD reductions, trade-offs with occupancy sensing controls
Skylighting in lower ceiling heights	Skylighting required in spaces > 15 ft, related to cost of lighting well and spacing of skylights. Technologies to reduce cost of light wells and to spread light so skylights can be further apart.
Egress lighting	Turn all the way off when space is unoccupied. Effort involves working with state fire marshal and perhaps NFPA.
Economizers	Catch up to IECC - required down to 33 kBtu/h, FDD updates
Façade and landscape lighting	ASHRAE has lower LPDs
Parking lot lighting (tall pole motion sensing?)	Motion controlled bi-level expanded to above 24 ft if technology ready. Consider expanding to other applications.
Solar pool heating for hotel/motels	Scoped out as cost-effective application of solar pool heating (year round operation)
Lab fume hoods, Occupancy sensing control of sash	Sash can be closed when no one is in front of fume hood. Saves energy and increases IAQ
Streamline and remove exceptions	Simplify and expand scope when possible
Plug-in hybrid and EV charging circuit	Reduces transportation costs and emissions, coincident with PV output
Plug for trucks at refrigerated warehouses	
Nonresidential ACM	
Refrigeration model in ACM	Allow trade-offs
Whole building (BEARS) model including deemed plug loads.	Software also generates BEARS rating and ZNE rating
Improved Natural Ventilation simulation	
PV model offsets consumption	Also useful; for ZNE rating
Radiant model including comfort	Provides accurate estimate of benefit of radiant

	cooling methods
Improved VRF simulation	Current model may be inaccurate. May require added manufacturer data for credit
Base case WWR by building type	ASHRAE 90.1 has reduced WWR for dome building types (i.e. 22% for schools, 11% for retail, 7% for grocery store, 19% for small office etc.)
Solar absorption air conditioning	
Combined heat and power	
Process Loads	
Evap fan speed control for walk-ins	Saves fan energy and compressor energy
Pipe sizing for compressed air systems	Pressure drop losses reduced
Specific efficiency requirements for refrigeration equipment	
Air dryer efficiency for compressed air	Modulating systems versus on/off systems
Capacity controls for centrifugal compressors	Remove exception from compressed air system requirements
Preliminary Residential Measures	
Low-rise multi-family prescriptive package	
QII - Quality Insulation Installation inspection	
All high efficacy lighting	Show availability of high quality high efficacy products for all sockets. Trade-off with PV
Ducts in conditioned space or ductless HVAC	Variety of methods, cathedral ceilings, scissor truss, mini-splits etc.
Tested Infiltration < 3 ACH 50	Catch up with IECC, have to show IAQ is OK, may be done in conjunction with mandatory CALGreen to reduce source pollutants
Compact water distribution	Measured length of pipe between water heater and fixture
Controlled supply mech ventilation	Better air quality, cleaner house
Dual path PV with high efficiency HVAC and DHW	
Coastal compressorless comfort	White paper for 2013 standards
Walls - R-21 + R5 in all CZs	Also consider R-15+ R-8 exterior insulation
Windows 16% of floor area	Highly controversial, should be based on survey
Heat recovery ventilator	Heat recovery in very hot or very cold climates
Simplify and remove exceptions	
Plug-in hybrid and EV charging circuit (MF)	
High efficiency white goods	Credit in model perhaps prescriptive trade-off

Residential ACM	
Multi-family modeling	
Evaporative cooling modeling	
Ductless AC system modeling	
Sealed attic modeling	
Whole building (HERS) model including deemed plug loads.	Basis of HERS rating and ZNE
PV model offsets consumption	Supports ZNE goal
Locational efficiency credit when solar access is low	Prepare for ZNE or equivalent

Table 7 includes a preliminary list of Title 20 measures under consideration by the CEC for the 2012-2015 Title 2- cycle. These will inform IOU advocacy work .

Table 7: Title 20 Appliance Standards – Preliminary Measures.

Title 20 Measure	Description (all subject to change)
Lighting	
Dimming ballasts	Minimum efficiency standards for dimming ballasts, and possible limits on standby wattage. Standard would likely use the Relative System Efficacy (RSE) or the Ballast Luminous Efficiency (BLE) metric, with minimum performance requirements at full light output only or at several light levels.
Multifaceted-Reflector lamps	Minimum efficiency standards for multifaceted-reflector lamps, possibly with tiered standards. May also require minimum light quality/lamp performance standards.
LED lamps	Require LED lamps to meet minimum performance requirements (e.g. dimming and lamp life), minimum light quality standards (e.g. CRI), and modest efficiency (lpw) requirements.
EISA exempt lamps	Apply existing T20 general purpose light bulb standards to EISA exempt bulb types, including: 3-way, 2,601 – 3,000 lumen, shatter-resistant. candelabra base, intermediate base. All can accommodate halogen capsules for reduced power. Consider coverage at similar stringency as non-exempt bulbs (approx. 30% lower power)
Lighting Accessories	Maximum energy use and standby power for nightlights (NL), maximum power/bulb requirements for decorative string lights (DSL), and maximum power requirements for illuminated house numbers (IHN).
Outdoor Lighting	Sets minimum performance requirements for pole-mounted outdoor lighting, including street, highway, parking, and area fixtures with "controls-ready" requirements in some cases.

Linear fluorescent fixtures	Propose test and list requirement for Energy Effectiveness Factor (EFF) and listing on product documentation resulting Target Efficacy Rating (TER) values from a combination of lamp lumens and ballast factors.
Illuminated street number signs	Set an efficacy standard (active power limit) to effectively require LEDs. Recommend requiring that all illuminated address numbers utilize photo-switches. Finally, recommend a standby power limit of 0.75 W.
Plug-in luminous signs	Set a standard establishing maximum power per square foot of illuminated area, and additional control requirements (required integral on/off switch, supplemental control for signs with face area(s) greater than 4 sqft).
Computers	Propose maximum energy requirements and power management enablement upon shipment for desktops and laptops; minimum power supply unit efficiencies for desktops. Exploring energy use limits or power limits in different operating modes.
Servers	Propose minimum power supply unit efficiencies and power proportionality for servers.
Game consoles	Set standard to require an auto power down feature and establish a maximum allowable standby power level.
Computer/video displays	Set maximum On Mode and Sleep Mode power consumption levels, as a function of screen size. Consider luminance and automatic brightness control requirements.
Set top boxes (terrestrial, cable and satellite)	Propose an energy use limit for new STBs. May include prescriptive requirements such as auto-off feature and performance-based maximum power demand per defined feature set (e.g., per tuner). Develop test and list requirements for small networking equipment.
Imaging Equipment	Propose maximum total energy consumption (TEC) levels for imaging equipment, which includes copiers, fax machines, printers, scanners, and all-in-one devices.
Low power modes	May propose required low-power modes, with maximum power levels, for various equipment. Low power modes include sleep, standby, idle, off.
Power Factor Interactive Effects	Appliance energy efficiency performance is influenced by power factor, such that losses in distribution circuits can be reduced by improving poor power factor. This is currently being studied in PIER research. This proposal would bring PIER findings into code as a consistent policy for appliances where merited
Water and Miscellaneous	
Toilets and Urinals	This standard proposal revises the current standards in Title 20 regulations to conform to the legislatively enacted performance standards of AB715, by having toilets have 1.28 gallons per flush and urinals have 0.5 gallons per flush effective January 1, 2014.
Air Filter Labeling	Require a label for air filters (a consumer version of the existing AHRI 680 label) so that consumers and designers can select the appropriate

	filter for the system.
Pool and Spa Equipment	Update current regulations to better align with APSP 15. Add performance efficiency requirements for new and replacement motors and pool heater hydraulic performance. Require labeling of efficiency performance and compliance information on portable electric spas to better inform consumers.
Faucets	This standard proposal sets the maximum flow rate for lavatory faucets and lavatory replacement aerators at 1.5 gpm at 60 psi, effective January 1, 2014. It also expands the definition of lavatory replacement aerator to include all flow restricting accessories, to encourage design best practices.
Water Meters	Propose requiring testing for accuracy of residential water meters at levels indicative of household leaks, to better identify and prevent leaks.
Landscape Irrigation Equipment	Set performance standards and labeling requirements for landscape irrigation controls and sensors; require a rain shut-off device and a test and list for landscape irrigation controllers (and add-on devices) for standby mode power.
Commercial Clothes Dryer	Commercial gas dryers are regulated by neither federal nor California regulations; there exists the opportunity to establish new Title 20 standards for commercial gas dryers to be sold in California. The C&S program will develop the testing procedure for Energy Factor of commercial clothes dryers, and establish a minimum performance requirement.
Refrigeration Condensing Units	Develop test procedure for EER for fixed output refrigeration condensing units and part load EER for variable output refrigeration condensing units. Establish a minimum performance requirement. Require either floating head control; require systems operate at 70°F or lower min. condensing temp.

Table 8 shows a preliminary list of federal appliance standards rulemaking events. IOUs will respond to rulemaking events carried out by USDOE, and possibly others, that impact California.

Table 8: Federal Appliance Standards

Product Category	DOE Proceeding Event Description	Anticipated Date
3-Phase CAC	Standard Preliminary Technical Support Analysis Standard Notice of Proposed Rulemaking	Dec-13 Dec-14
ASHRAE Products	Standard Final Rule	Nov-13
CACs, HPs (air-cooled)	Standard Final Rule	Jul-13
Ceiling Fans	Standard Final Rule	Jul-13

CFL (Medium Base)	Test Procedure Final Rule	Jun-13
Commercial Boilers	Standard Framework	Jul-14
Commercial Clothes Washers	Standard Preliminary Technical Support Analysis Standard Notice of Proposed Rulemaking	Jul-13 Jul-14
Commercial Ice Makers	Standard Final Rule	Jul-13
Commercial Refrigeration	Standard Final Rule Test Procedure Final Rule	Jan-13 Jan-13
Commercial Unit Heaters	Standard Final Rule	Jul-13
Dehumidifiers	Standard Preliminary Technical Support Analysis Standard Notice of Proposed Rulemaking	Dec-13 Dec-14
Dehumidifier (Active Mode)	Test Procedure Notice of Proposed Rulemaking Test Procedure Final Rule	Jan-13 Jul-13
Direct Heating Equipment	Test Procedure Final Rule	Sep-13
Dishwashers	Standard Preliminary Technical Support Analysis Standard Notice of Proposed Rulemaking	Jul-13 Jul-14
Exit Signs	Test Procedure Final Rule Standard Final Rule	Jun-13 Jul-13
Furnace Fans	Test Procedure Final Rule Standard Notice of Proposed Rulemaking Standard Final Rule	Apr-13 Dec-13 Dec-13
General Service Lamps	Standard Framework	Jan-14
GSFLs	Standard Notice of Proposed Rulemaking Standard Final Rule	Aug-13 Apr-14
HIDs	Standard Final Rule	Jan-13
IRLs	Standard Notice of Proposed Rulemaking Standard Final Rule	Aug-13 Apr-14
Microwaves (Active)	Standard Framework Standard Preliminary Technical Support Analysis	Jan-13 Jul-14
Pool Heaters	Test Procedure Final Rule	Sep-13
Pre-rinse spray valves	Standard Final Rule	Jul-13
PTACs, PTHPs	Standard Framework	Sep-13
Ranges, Ovens	Standard Framework	Mar-14
Residential Boilers	Standard Preliminary Technical Support Analysis Standard Notice of Proposed Rulemaking	Dec-13 Dec-14
STBs	Test Procedure Final Rule Standard Final Rule	May-13 Jun-13
Televisions	Standard Final Rule	Jan-13

Torchieres	Standard Final Rule	Jul-13
Traffic Signals	Standard Final Rule	Jul-13
Vending Machines	Standard Framework	Jul-14
Water Heaters	Test Procedure Final Rule	Sep-13
Wine Chillers	Standard Preliminary Technical Support Analysis Standard Notice of Proposed Rulemaking	Aug-13 Aug-14

8. Coordination & Integration

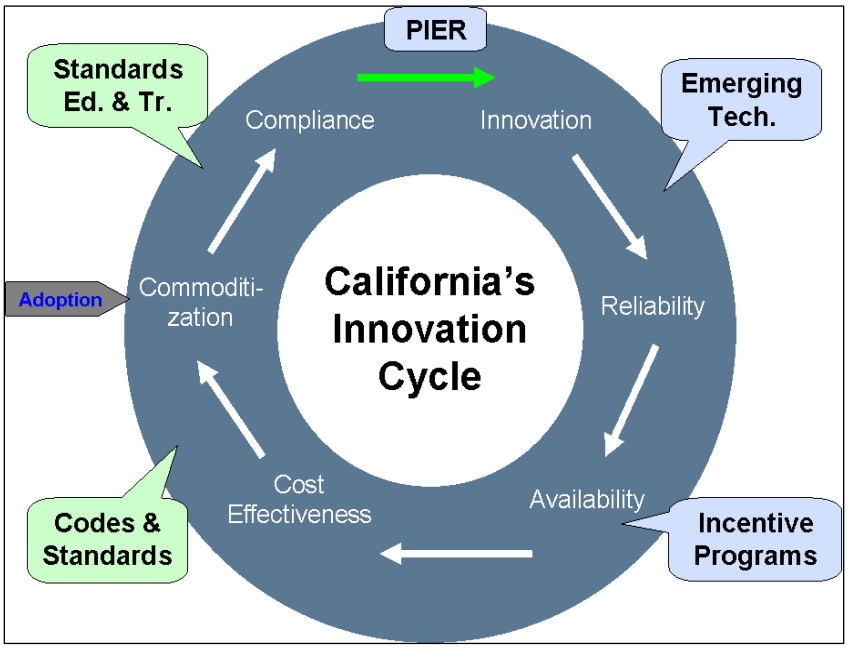
At the CPUC's direction, the C&S program is adding a non-resource Planning and Coordination Subprogram to improve the integration of portfolio program offerings. The C&S team will coordinate with both internal and external entities to establish a dynamic and integrated planning and implementation process to methodically and purposefully accelerate the movement of successful, cost-effective measures from the ET program through voluntary offerings and ultimately to adoption into standards. The three primary functions of the planning and coordination subprogram include strategic planning, internal coordination and communication, and statewide collaboration.

a) C&S Statewide Coordination

Many requirements for C&S coordination are derived from the CPUC's objective to mitigate climate change through regulatory objectives, including Title 20 and Title 24. While the C&S program comprises the primary intervention to achieve these objectives, it must be considered within the context of California's innovation cycle:

- Adoption causes commoditization in the sense that a once high margin product becomes the industry standard.
- Commoditization spurs companies to innovate.
- Innovation creates new, differentiated, high-margin products for the competitive market.
- Voluntary programs commercialize new innovations.
- Commercialization creates code readiness leading to adoption.

Innovation Cycle



Since the primary purpose of the C&S program is to propose and support adoption of code enhancements, it is essential that IOUs collectively respond to all significant energy savings opportunities identified for a future code update cycle. For example, IOUs are now planning how best to coordinate efforts to address a long list of potential Title 24 code enhancements for the 2011 code cycle. In general, planning is conducted on an as needed basis.

Codes and standards operations are conducted relative to a multi-year time horizon, so statewide meetings organized on a quarterly basis are sufficiently frequent to coordinate activities. Some CASE studies are developed through co-funding agreements when multiple IOUs are interested in or have specific value-added knowledge, perhaps through previous research. More typically, however, code proposals are developed by one IOU on behalf of the statewide since each proposal is a fraction of the program budget. During these meetings, the primary objectives are to discuss CASE study objectives and develop mutual support for public proceedings.

The C&S program will enhance coordination and integration of codes and standards with other energy efficiency programs to maximize energy savings and demand reducing by coordinating training programs and utilizing the experience gained in resource programs to inform the development and advocacy of new codes. The C&S program will work with the Government Partnerships to improve code compliance, adopt above code ordinances, and provide training and education. The C&S compliance improvement subprogram will focus efforts on HVAC new installations and replacements in coordination with the HVAC program. The C&S program will also meet periodically with HVAC program staff to discuss compliance improvement strategies, training, and other program needs.

Coordination between C&S and other parts of the portfolio falls into one of two categories: existing standards and future standards. Compliance with code is essential to completing the commoditization process and capturing the benefit of commercialization efforts for the benefit of society, so the CI subprogram leads efforts to implement existing standards through development of core activities that can be delivered either through, or in coordination with, other programs. Opportunities are identified through small group meetings between C&S and each target group such as workforce education and training, local government partnerships, new construction programs. In addition, the IOUs will coordinate program efforts with the local utility integration teams and the Statewide Integration Task Force to identify successful integration approaches and offerings, potential pilot programs and metrics.

Small group meetings mentioned above, are particularly useful, as they serve to identify incentive program opportunities to leverage the pull of existing standards that have effective dates far enough in the future to accommodate program changes. For example, an appliance standard adopted with an effective date two years hence would provide an opportunity to develop an incentive program pull that complements the C&S push.

Coordination activities around future standards are, likewise, developed through individual targeted meetings. Once the C&S team has identified potential code enhancement opportunities for a future code proceeding, the team meets with Mass Market, Targeted Market, Emerging Technologies, HVAC, demand response, or general education and training leads to discuss gaps between adoption needs and current code readiness. As appropriate, new measures may be added to incentive programs, new projects may be added to the ET portfolio. Sometimes, when ongoing CEC proceedings coincide with incentive program planning, incentive offerings can be integrated with code enhancement proposals to increase influence on proceedings.

Coordination with external organizations falls into a few broad categories. A particular code proposal typically attracts directly affected industry stakeholders. If an industry employs associations organized to oppose energy efficiency standards – which is usually the case – IOUs will seek support from other advocates and share information that enables their advocacy, as well as ours. Sometimes IOUs are able to work directly with industries that are not, in principal, opposed to all regulations.

b) C&S Coordination with External Organizations & Entities

As Federal preemption continues to grow, and as DOE continues to increase federal proceedings activities, it is necessary for California IOUs to increasingly engage with national organizations such as ACEEE, ASAP, and the NNRDC. In particular, since the innovation engine, as pictured above, turns over once every three years in California and once every eight to ten years at DOE, the C&S program needs to work with national organizations to relax federal preemption policies to better help California meet AB 32

energy efficiency targets. California IOUs have ramped up operations to contribute materially DOE proceedings through analysis, letters, and negotiations.

At a statewide and local level, the C&S program will develop training and compliance improvement activities with entities that include, but are not limited to, California Building Industry Association, local chapters of the Building Industry Association, Build it Green, Institute of Heating and Air Conditioning Industries, International Brotherhood of Electrical Workers, National Electrical Contractors Association, California League of Cities. Additionally, outreach and communications for Title 20 will include industry associations such National Electric Manufacturers Association, American Lighting Association, California Retailers Association, and the International Pool and Spa Association.

How the Codes & Standards Program will Coordinate with Other Energy Efficiency Programs

Program With Which C&S Will Coordinate	Coordination with Advocacy Subprograms	Coordination with CI or RC Subprograms
HVAC	➢ Research possible scenarios to help improve HVAC quality construction ➢ Develop a whole building comfort metric that is the basis of compressorless homes in the coastal climate zones ➢ Review mandates to increase the use of FDD and improvements to FDD technologies	➢ Research the HVAC permitting tools available on the market, select permitting tools to test during the local government process pilot, and determine which best practices and tools to incorporate into the building official and HVAC contractor role-based training curriculum the program will develop. ➢ CI will work with the CEC, CALBO and the CSLB to identify possible penalties that may be applied to contractors who do not pull required permits or operate without the appropriate licenses. The program will investigate potential penalties during the local government process pilots and incorporate those penalties that prove effective during the pilot into the role-based training curriculum that the program will develop and roll out to additional jurisdictions. ➢ CI subprogram personnel will

Program With Which C&S Will Coordinate	Coordination with Advocacy Subprograms	Coordination with CI or RC Subprograms
		work with HVAC Quality Installation and Workforce Education and Training program staff, utility education centers, and regulatory agencies to develop a brand, incentive mechanism, and consumer campaign, and technician training and certification programs. CE will evaluate the recently completed ACCA (Air Conditioning Contractors of America) Quality Installation Specification that has been adopted by the EPA ENERGY STAR Program to determine how to incorporate this into role- and measure-based training to be provided by the IOUs. ➢ Investigate the feasibility of an HVAC serial number tracking process to increase compliance. Various HVAC industry groups and HVAC distributors have expressed an interest in pursuing this as a way to increase the quality of installations and better ensure Title 24 compliance.
Government Partnerships		➢ CI subprogram personnel will conduct a holistic process pilot in select building departments in addition to developing and delivering role-based tools and training to building department personnel. ➢ RC subprogram personnel will encourage local governments to lead by example, and to adopt codes for government buildings that match or exceed the requirements for the private sector within their jurisdiction. Those

Program With Which C&S Will Coordinate	Coordination with Advocacy Subprograms	Coordination with CI or RC Subprograms
		local governments that do not wish to adopt reach codes for the private sector will be encouraged to at least adopt more stringent codes for their own buildings. ➢ Initial C&S efforts will focus on encouraging and supporting local governments, designers, and builders/contractors to implement and enforce existing acceptance testing requirements. CI will work with the CEC, CA Commissioning Collaborative, and industry organizations such as SMACNA to conduct outreach and provide acceptance testing education at all levels of the supply chain.
Workforce Education and Training		➢ CI will work with Workforce Education and Training program managers, CABEC, Sonoma State University, CalPoly San Luis Obispo and others throughout the state to develop a curriculum that can be implemented at the state and community college level to expand current energy-related offerings and train building energy analysts in the theory and concepts of energy-efficient building design, simulation and construction. ➢ CI is working with IBEW, NECA, California Community Colleges, and others to develop and implement an electrical contractor's training program for advanced lighting controls. This is a critical step in facilitating the installation of the sophisticated lighting controls that are essential to meeting the AB1109 Huffman

Program With Which C&S Will Coordinate	Coordination with Advocacy Subprograms	Coordination with CI or RC Subprograms
		Bill and zero net energy goals.
Targeted Markets/Mass Market/Emerging Technologies	➢ Through small group meetings, C&S will work with the Mass Market, Targeted Market and Emerging Technologies programs to identify incentive program opportunities to leverage the pull of existing standards that have effective dates far enough in the future to accommodate program changes. For example, an appliance standard adopted with an effective date two years hence would provide an opportunity to develop an incentive program pull that complements the C&S push. For promising measures that are evaluated by the ETP, the C&S program may propose that they are included in reach codes in parallel with EE incentive programs. ➢ C&S will work with the targeted and mass market program managers to require program participants to complete and submit the applicable acceptance tests required by Title 24 to receive an incentive for HVAC and lighting controls equipment. This will increase compliance with the acceptance tests and help assure the incented equipment is installed according to code intent.	➢ CI will work with fellow energy efficiency program managers to identify and fulfill code-related training needs in order to keep program managers up to date on current and future codes, and to help prepare IOU sales reps with the knowledge they need to effectively market incentive programs.

9. Marketing & Outreach/Education & Training

Outreach for advocacy activities occurs through telephone calls and e-mails to industry stakeholders throughout the CASE study development process, leading up to commencement of a CEC rulemaking. After commencement of CEC rulemaking proceedings, CASE studies are presented during public workshops and hearings conducted by the CEC that are typically attended by building or appliance industry representatives, environmental groups, compliance industry representatives including local government officials, advocates from other states. In response to industry issues and concerns, the IOUs and their consultants will contact specific representatives or conduct stakeholder meetings to address specific issues more broadly. Following adoption hearings, the IOUs participate in developing compliance manuals.

Compliance improvement encompasses numerous industries engaged in supplying buildings and appliances to California; hence, outreach and marketing activities will be conducted through a variety of channels. IOU's training centers will conduct direct outreach to industry associations such as the Contractor State Licensing Board, California Building Officials Association, California Association of Building Energy Consultants, Consumer Electronics Association, and National Electrical Manufacturers Association. E-mail solicitations and paper calendars are sent to individuals notifying them of upcoming classes. Local governments will also be contacted through local government partnerships and circuit riders assigned to provide consulting services.

10. Quality Assurance & Evaluation Activities

To help ensure quality assurance and effective evaluation, the IOUs will continue their ongoing efforts to track and assess the effectiveness of the C&S Program in advocating for new codes, and for increasing compliance with existing codes.

The C&S program will continue to support the impact evaluation efforts of the CPUC and its contractors by documenting code advocacy efforts, and documenting compliance improvement efforts and education and training efforts and their effects on participant behavior. The IOUs will coordinate with the CPUC and their impact evaluation contractors to ensure that the sufficient type and level of data are being collected at the appropriate level of detail to enable an estimation of energy savings related to codes and standards activities. This includes supporting the CPUC in their research effort to establish Title 20 and Title 24 baselines, and track changes in adoption and compliance over time. This includes providing appropriate program data, as well as encouraging the participation of vendors, contractors, building officials and others, as appropriate, in providing information for establishing baselines and changes in penetration over time.

For the purpose of quality assurance in carrying out and improving the C&S program, the IOUs will be conducting various qualitative evaluation activities to establish IOU effectiveness in various market transformation activities. These include but are not limited to:

- Code adoption - Research with participants in the code adoption process to assess the level and quality of participation by the IOUs and other stakeholders. This includes interview-based research, as well as review of documentation of participation.
- Compliance Improvement – Effectiveness of various education and training activities, based on pre- and post- participation assessment of 'knowledge swing' of participants, and commitments to action made by participants and participant organization that stem from compliance improvement activity. Initial assessments will be succeeded by assessments in the post period to identify changes in code-related activity resulting from the CI subprogram.
- Reach Code Assistance – Effectiveness of IOU efforts to assist local governments in establishing, implementing and enhancing compliance with reach codes. Initial assessments of energy codes and code compliance, local code support capability and other factors will be followed by an ongoing assessment of the effects of IOU reach code assistance.

For compliance improvement, the IOUs will be using this assessment process to identify changes in awareness, capability and behavior change among individual CI participants, and participant organizations, resulting for the various compliance improvement activities. The IOUs will also look into calibrating our assessment of compliance improvement through evaluations of non-participant awareness, capability and behavior changes. For example, if there is a compliance improvement effort focused on building officials, the research could include an assessment of awareness, capability and behavior of building officials who did not participate in the training.

Additional, formative research will be conducted to provide insight into emerging issues related to current and pending codes and standards. Specifically, research will be carried out to identify issues and trends appearing along the delivery chain for appliances as well as for building practices.

11. Program Theory & Logic Model and Performance Indicators

On December 2, 2010, the Commission issued Resolution E-4385, approving Program Performance Metrics (PPMs) for Pacific Gas and Electric Company, Southern California Edison Company, Southern California Gas Company and San Diego Gas and Electric Company for 2010-2012 statewide energy efficiency programs and subprograms. In addition, this Resolution approved updated logic models for the statewide programs. Below are the approved logic models for the C&S program.

a) Building Codes
b) California Appliance Standards
c) Federal Appliance Standards
d) Compliance Improvement

e) Reach Codes
f) Planning and Coordination

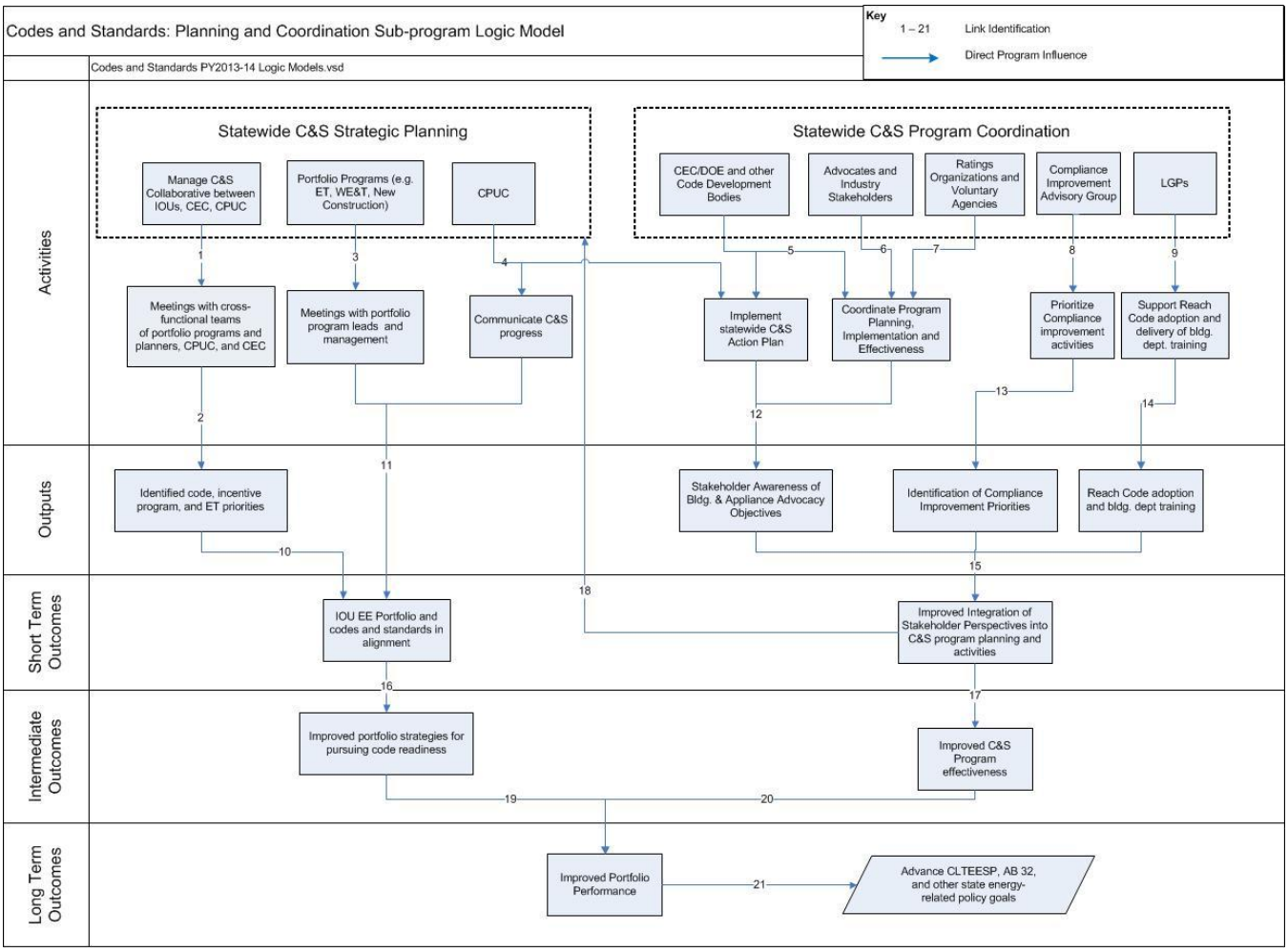
Logic models will be improved based on experience and finalized based on application to specific industries, local governments.
Logic Models and the accompanying Program Theory and Program Indicators are tools designed to illustrate program structure and operation for the purpose of program management. This logic model is a schematic of the program as planned.

A program theory is the basis of a logic model. Effective program management applies program theory, and related performance indicators are used to determine whether program theory is correct. Indicators enable informed management responses that improve programs.

Performance indicators are intended to serve as a program's 'dashboard'; displaying information necessary for effective program operation. As with automobile dashboards; indications are neither good nor bad, but enable appropriate management responses that maintain and/or improve program performance.

Logic models, program theories, and performance indicators can provide evaluators an understanding of program activities, outputs and outcomes. However, they are not intended as the basis for estimating, valuing, or attributing program savings as they focus on program operation rather than program results. Revised logic models and program theory tables will be included in a future addendum to the PIP.

Revised logic models and program theory tables will be included in a future addendum to the program implementation plan.


Codes and Standards: Planning and Coordination Sub-program Logic Model
Codes and Standards PY2013-14 Logic Models.vsd
Key
1 – 21
Link Identification
Direct Program Influence
Activities
Outputs
Short Term Outcomes
Intermediate Outcomes
Long Term Outcomes
Statewide C&S Strategic Planning
Statewide C&S Program Coordination
Manage C&S Collaborative between IOUs, CEC, CPUC
Portfolio Programs (e.g. ET, WE&T, New Construction)
CPUC
CEC/DOE and other Code Development Bodies
Advocates and Industry Stakeholders
Ratings Organizations and Voluntary Agencies
Compliance Improvement Advisory Group
LGPs
Meetings with cross-functional teams of portfolio programs and planners, CPUC, and CEC
Meetings with portfolio program leads and management
Communicate C&S progress
Implement statewide C&S Action Plan
Coordinate Program Planning, Implementation and Effectiveness
Prioritize Compliance improvement activities
Support Reach Code adoption and delivery of bldg. dept. training
Identified code, incentive program, and ET priorities
Stakeholder Awareness of Bldg. & Appliance Advocacy Objectives
Identification of Compliance Improvement Priorities
Reach Code adoption and bldg. dept training
IOU EE Portfolio and codes and standards in alignment
Improved Integration of Stakeholder Perspectives into C&S program planning and activities
Improved portfolio strategies for pursuing code readiness
Improved C&S Program effectiveness
Improved Portfolio Performance
Advance CLTEESP, AB 32, and other state energy-related policy goals
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21

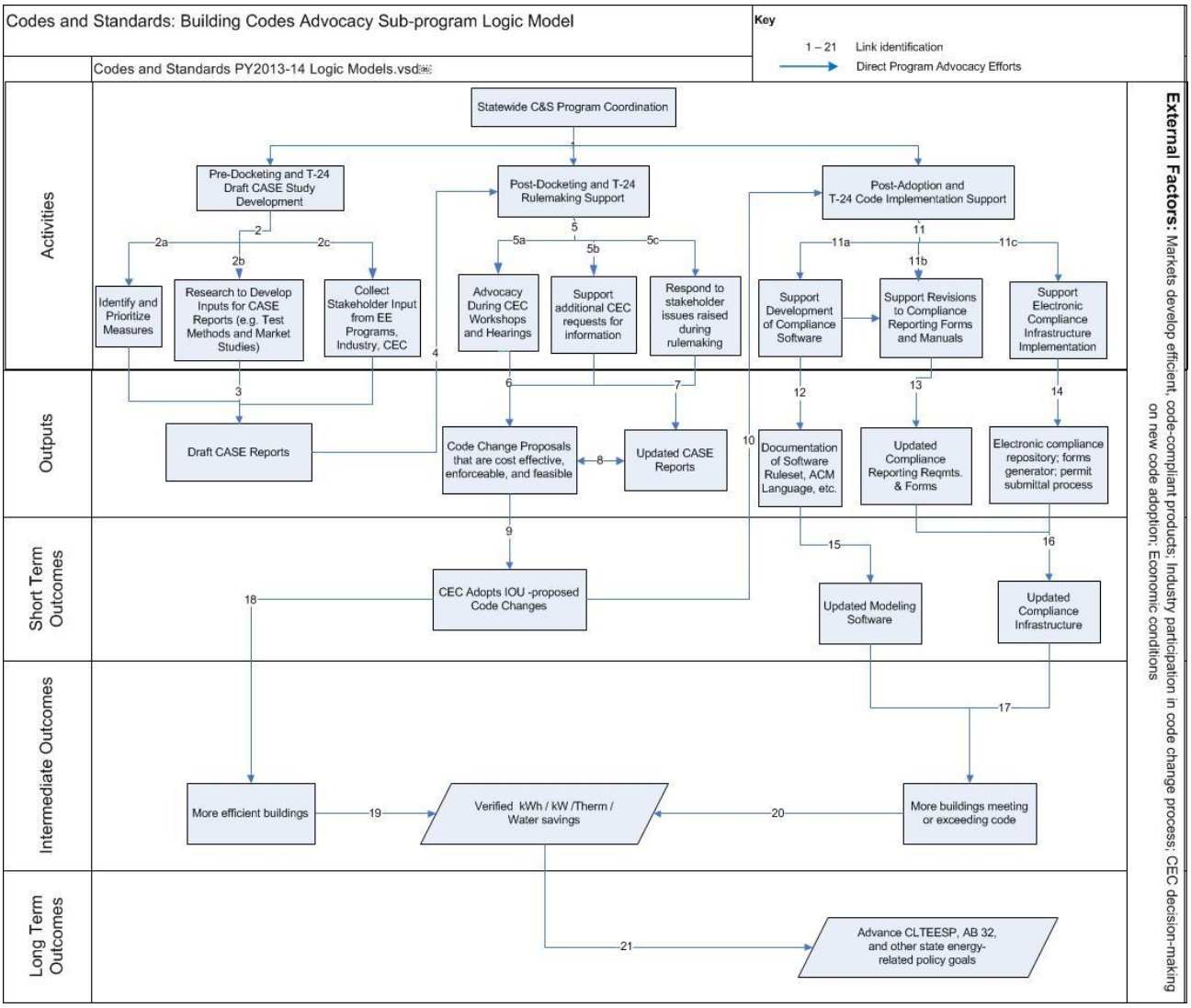
Codes and Standards: Planning and Coordination Program Theory and Indicators

Link	Program Theory/Activity	Potential Indicators
1	IOUs P&C Subprogram provides a process that maintains a Codes and Standards Collaborative with CEC and CPUC for strategic planning and aligns portfolio planning activities to advance long term strategic goals	• P&C subprogram holds quarterly statewide strategic planning meetings with CEC and CPUC • Communication with CEC and CPUC Collaborative members • IOUs document subprogram activities' alignment with California Long Term Energy Efficiency Strategic Plan (CLTEESP)
2	IOUs establish cross-functional teams with portfolio programs, the CPUC, and the CEC, to identify codes readiness priorities and other C&S priorities relative to policy goals.	• Coordination meeting with portfolio programs including incentive, emerging technologies, and workforce education and training (WE&T) programs to identify C&S readiness priorities • Coordination meeting with CEC to identify C&S priorities • Coordination meeting with representatives from CPUC, and CEC to review C&S priorities relative to policy goals, for example: zero net energy (ZNE), AB 1109, and other Action Plan objectives.
3	C&S Program coordinates with other portfolio programs to develop an integrated, forward-looking approach to align new construction program offerings with base code and reach code. C&S program collaboration with the WE&T will prepare contractors and technicians to implement current codes, and prepare them with technical training on advanced technologies to improve code implementation	• Coordination meeting with new construction program managers • Integrated plan that documents how new construction programs are aligned with base code and reach code requirements • Coordination meeting with WE&T program managers • Integrated plan that documents how WE&T training aligns with base code and reach code requirements.
4	C&S program on-going communication with the CPUC will improve implementation of the C&S Action Plan	• C&S program monthly calls with CPUC personnel to share progress and discuss issues • Progress report on implementing C&S Action Plan.

5	C&S program on-going collaboration with state and federal code development bodies including CEC, DOE, ASHRAE, IECC and other code bodies will improve implementation and effectiveness of the C&S Action Plan and other building and appliance related code efforts	• C&S program meetings with CEC and DOE personnel and ASHRAE and IECC committee members to share progress and discuss issues • Progress report on implementing C&S Action Plan • C&S program periodic calls and meetings with other code development bodies to share progress and discuss issues • Progress report on coordination with other C&S efforts
6	C&S program on-going collaboration, and negotiation with building and appliance related code advocates and industry stakeholder will improve implementation and effectiveness of the C&S Action Plan and success of other C&S efforts	• Periodic calls and meetings with national industry stakeholders regarding building and appliances standards • Progress report on collaboration and negotiation efforts, implementation of C&S Action Plan and work on other code efforts
7	C&S program on-going collaboration and coordination with national ratings organizations and voluntary high performance programs will improve implementation and effectiveness of the C&S Action Plan and other C&S efforts	• Periodic calls and meetings with national ratings organizations (e.g. NFRC, CRRC) and voluntary programs (e.g. EnergyStar, CHPS, LEED) regarding building and appliances standards • Progress report on collaboration and negotiation efforts, implementation of C&S Action Plan and work on other code efforts
8	Creation and activity of Compliance Improvement Advisory Group will increase compliance activities coordination to improve compliance	• Quarterly meetings with Compliance Improvement Advisory Group regarding compliance improvement activities
9	Communication and coordination with Local Government Partnership (LGP) will increase compliance activities coordination to improve compliance	• Quarterly updates to LGP Program regarding reach code adoption progress and delivery of training to building departments
10	IOUs' cross-functional teams' coordination and agreement result in statewide codes and standards activities and proposals consistent with IOUs' portfolio program goals	• Communication among team members including documentation of agreed upon goals and plans. • Increased feasibility and code readiness of efficient products and practices

		• IOU program portfolio goals alignment with statewide codes and standards (CEC) plans and activity, for example: ZNE, AB 1109, and other Action Plan objectives
11	C&S Program coordination and collaboration with other portfolio programs, and communication to CPUC result in portfolio program goals consistent with statewide codes and standards activities and proposals	• Documentation of agreed upon goals and plans • IOU program portfolio goals alignment with statewide codes and standards (CEC) plans and activity, for example: ZNE, AB 1109, and other Action Plan objectives
12	C&S program on-going communication and coordination with all stakeholders leads to stakeholder awareness and understanding of the C&S Action Plan and advocacy, planning and activities.	• Progress report on implementing C&S Action Plan • Documentation of agreed upon objectives, goals, and plans
13	CIAG compliance improvement discussions and activities will result in prioritized code compliance improvement.	• Progress report on implementing C&S Action Plan • IOU compliance improvement activities are aligned with statewide codes and standards (CEC) plans and activity, for example: ZNE, AB 1109, and other Action Plan objectives
14	C&S program coordination with LGP Program training to building departments will improve understanding of reach code activities Communication and coordination with Local Government Partnership (LGP) will increase compliance activities coordination and improve compliance	• Quarterly updates to LGP Program regarding reach code adoption progress and delivery of training to building departments • Reduction in time for building officials to process paperwork • Reduction in number of compliance mistakes due to resources and training
15	Communication and coordination with CIAG, LGP and other stakeholders will improve integration of various perspectives into C&S planning and activities Stakeholder awareness of C&S program advocacy objectives and goals leads to improved coordination and integration of planning and activities	• CIAG, LGP and other stakeholders recognition of C&S benefits, leading to support of activities to optimize codes through enforcement • Documentation of integration of stakeholder perspective and objectives in C&S plans

16	Portfolio program goals consistent with statewide codes and standards activities results in improved strategies for pursuing code readiness	• IOU EE programs support test method development and provide collected test data • Increased market presence and acceptance of efficient products and practices based on IOU portfolio programs
17	Coordination with all stakeholders will improve C&S program effectiveness	• Technical responses to comments and concerns voiced by stakeholders • Improved program performance metrics including lower TRC and greater energy savings.
18	Integration of various stakeholder perspectives into C&S planning and activities enhances statewide strategic planning	• Progress report on implementing C&S Action Plan • Documentation of agreed upon goals and plans • IOUs document subprogram activities' alignment with Strategic Plan
19	Improved portfolio strategies lead to improved portfolio performance	• Increased awareness and understanding of codes and standards by stakeholders • Reduction of noncompliant practices and appliances
20	Improved program effectiveness leads to improved portfolio performance	• Increased awareness and understanding of codes and standards by stakeholders • Reduction of noncompliant practices and appliances • Improved program performance metrics including lower TRC and greater energy savings
21	Improved portfolio performance leads to advancement towards long term strategic goals	• State policy objectives are met to achieve environmental, macroeconomic, and other non-energy benefits


Codes and Standards: Building Codes Advocacy Sub-program Logic Model
Codes and Standards PY2013-14 Logic Models.vsd
Key
1 – 21 Link identification
Direct Program Advocacy Efforts
Activities
Outputs
Short Term Outcomes
Intermediate Outcomes
Long Term Outcomes
Statewide C&S Program Coordination
Pre-Docketing and T-24 Draft CASE Study Development
Post-Docketing and T-24 Rulemaking Support
Post-Adoption and T-24 Code Implementation Support
Identify and Prioritize Measures
Research to Develop Inputs for CASE Reports (e.g. Test Methods and Market Studies)
Collect Stakeholder Input from EE Programs, Industry, CEC
Advocacy During CEC Workshops and Hearings
Support additional CEC requests for information
Respond to stakeholder issues raised during rulemaking
Support Development of Compliance Software
Support Revisions to Compliance Reporting Forms and Manuals
Support Electronic Compliance Infrastructure Implementation
Draft CASE Reports
Code Change Proposals that are cost effective, enforceable, and feasible
Updated CASE Reports
Documentation of Software Ruleset, ACM Language, etc.
Updated Compliance Reporting Reqmts. & Forms
Electronic compliance repository; forms generator; permit submittal process
CEC Adopts IOU -proposed Code Changes
Updated Modeling Software
Updated Compliance Infrastructure
More efficient buildings
Verified kWh / kW /Therm / Water savings
More buildings meeting or exceeding code
Advance CLTEESP, AB 32, and other state energy-related policy goals
1
2
2a
2b
2c
3
4
5
5a
5b
5c
6
7
8
9
10
11
11a
11b
11c
12
13
14
15
16
17
18
19
20
21
External Factors: Markets develop efficient, code-compliant products; Industry participation in code change process; CEC decision-making on new code adoption; Economic conditions

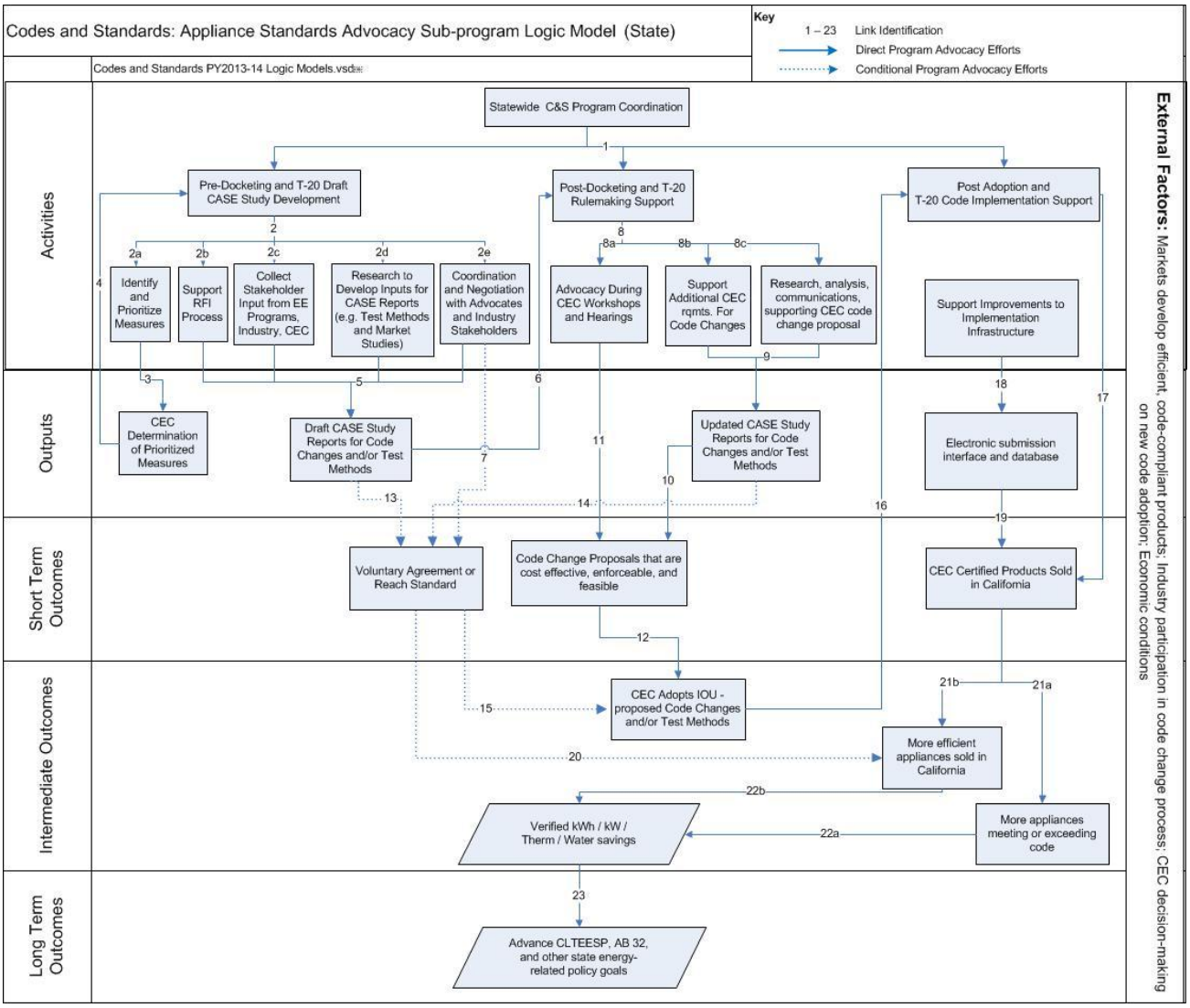
Codes and Standards: Building Codes Advocacy Program Theory and Indicators

Link	Program Theory/Activity	Potential Indicators
1	C&S Program managers coordinate their program activities to present a united, statewide IOU C&S Program and conduct activities from pre-docketing through post-adoption of T-24 building standards.	• C&S Program managers meetings and on-going communication
2	C&S Program conducts full range of advocacy efforts during pre-rulemaking processes to support successful code change development through outreach and advocacy to stakeholders	• 2a. Initial IOU assessment of measures/products indicates level of measure code-readiness
		• 2b. C&S Program documentation of market feasibility and cost-effectiveness • Documentation of test methods and required test results
		• 2c. C&S Program stakeholder meetings, outreach and on-going communication with IOU EE program managers, CEC staff and industry stakeholders • Documentation of IOU run stakeholder meetings, including invitee list, attendee list and meeting notes
3	C&S Program conducts initial assessment of code change opportunities based on feasibility, cost-effectiveness, market readiness and acceptance, availability of test methods and data, etc.	• Documentation of compliance research, market feasibility, potential energy savings, and cost-effectiveness • C&S Program stakeholder meetings, outreach and on-going communication • C&S Program supported test method development and test data • Communication with CEC, standard organizations committee members and other stakeholders
4	C&S program advocacy is presented at public CEC code proceedings	• Codes and Standards Enhancement (CASE) reports filed with CEC docket
5	C&S Program conducts full range of advocacy efforts to support rulemaking processes and successful code change development	• 5a. Communication with CEC, standard organizations committee members and other stakeholders
		• 5b. CASE reports include additional

		data, analysis and documentation based on comments raised during rulemaking
		• 5c. Code enhancement support documents including compliance research, market feasibility, potential energy savings, and cost-effectiveness • Written response to stakeholders' comments and questions
6	C&S program provides technical responses to stakeholder issues raised in public rulemaking proceedings, including responding to comments and concerns voiced by stakeholders	• Communication with CEC, standard organizations committee members and other stakeholders • C&S Program input to stakeholder and CEC staff comments and questions on proposed code changes • CASE reports documenting code change proposals that are cost-effective, feasible and enforceable
7	CASE reports are revised and updated during the code proceeding process.	• CASE reports documenting code change proposals that are cost-effective, feasible and enforceable • CASE reports include additional data, analysis and documentation based on comments raised during rulemaking
8	CASE reports are updated to include proposed code change language and additional information presented during the public rulemaking proceedings	• CEC analysis and workshop discussions, public notices and scheduling of workshops • Updated CASE reports filed with CEC docket
9	IOU-proposed code change language is included in the CEC adopted Title 24 (T24) Standards	• Final published CASE reports • Updated T24 Standards adopted and published by CEC
10	After new T24 Standards are adopted C&S program initiates efforts to support the CEC in updating code compliance materials	• Communication with CEC, standard organizations committee members and other stakeholders
11	C&S Program conducts full range of advocacy efforts to support successful code change implementation	• 11a. C&S Program supported compliance software development
		• 11b. C&S Program developed revisions to compliance reporting forms and

		manuals
		• 11c. C&S Program supported compliance electronic infrastructure development, including electronic repository, pre-processing of electronic documents, and electronic input to the permit process
12	C&S program develops documentation to revise compliance software requirements to reflect the most recent code updates based on CASE Studies	• C&S program provides compliance software revisions documentation to the CEC
13	C&S program develops updated compliance reporting requirements and forms to reflect the most recent T24 updates based on CASE Studies	• C&S program provides revisions to T24 Standards manual and forms to the CEC
14	C&S program supports the CEC in developing a permit repository system, which generates and stores compliance forms	• Communication and meetings with CEC and other stakeholders on repository system development, including electronic repository, pre-processing of electronic documents, and electronic input to the permit process
15	C&S program documentation of code compliance software revisions is accepted and approved by the CEC	• CEC approves and implements updated compliance software
16	CEC compliance infrastructure is updated with new compliance manuals and forms, reporting requirements, and a new permit repository system	• CEC approves revised compliance reporting requirements • CEC approves revised compliance manuals and forms • CEC develops an electronic compliance repository and new electronic permit submittal process
17	Improved compliance infrastructure, system and modeling software leads to more buildings meeting or exceeding T24 requirements	• Energy savings calculations submitted for permit approval with compliance rates
18	New building efficiency (T24) standards lead to more efficient buildings	• Energy savings calculations submitted for permit approval

19	More efficient buildings result in electric and gas energy savings, demand reduction, and water savings	• Energy savings calculations or building energy and water usage
20	More buildings meeting or exceeding code result in electric and gas energy savings, demand reduction, and water savings	• Energy savings calculations or building energy and water usage
21	Adopted and implemented codes lead to advancement towards long term strategic goals	• State policy objectives are met to achieve environmental, macroeconomic, and other non-energy benefits


Codes and Standards: Appliance Standards Advocacy Sub-program Logic Model (State)
Codes and Standards PY2013-14 Logic Models.vsd
Key
1 – 23 Link Identification
Direct Program Advocacy Efforts
Conditional Program Advocacy Efforts
Activities
Outputs
Short Term Outcomes
Intermediate Outcomes
Long Term Outcomes
Statewide C&S Program Coordination
Pre-Docketing and T-20 Draft CASE Study Development
Post-Docketing and T-20 Rulemaking Support
Post Adoption and T-20 Code Implementation Support
Identify and Prioritize Measures
Support RFI Process
Collect Stakeholder Input from EE Programs, Industry, CEC
Research to Develop Inputs for CASE Reports (e.g. Test Methods and Market Studies)
Coordination and Negotiation with Advocates and Industry Stakeholders
Advocacy During CEC Workshops and Hearings
Support Additional CEC rqmts. For Code Changes
Research, analysis, communications, supporting CEC code change proposal
Support Improvements to Implementation Infrastructure
CEC Determination of Prioritized Measures
Draft CASE Study Reports for Code Changes and/or Test Methods
Updated CASE Study Reports for Code Changes and/or Test Methods
Electronic submission interface and database
Voluntary Agreement or Reach Standard
Code Change Proposals that are cost effective, enforceable, and feasible
CEC Certified Products Sold in California
CEC Adopts IOU - proposed Code Changes and/or Test Methods
More efficient appliances sold in California
Verified kWh / kW / Therm / Water savings
More appliances meeting or exceeding code
Advance CLTEESP, AB 32, and other state energy-related policy goals
External Factors: Markets develop efficient, code-compliant products; Industry participation in code change process; CEC decision-making on new code adoption; Economic conditions

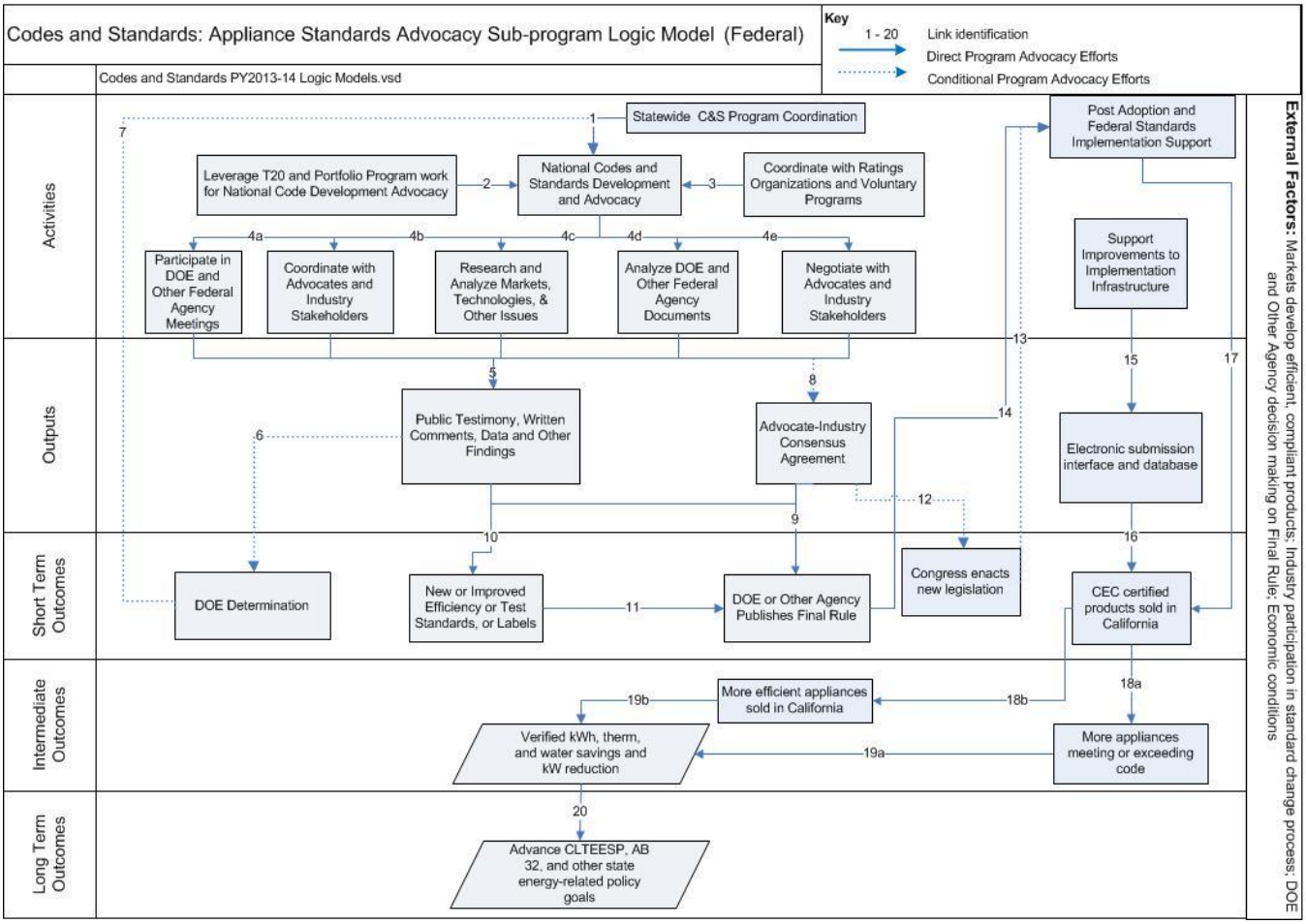
Codes and Standards: Appliance Standards Advocacy (State) Program Theory and Indicators

Link	Program Theory/Activity	Potential Indicators
1	C&S Program managers coordinate their program activities to present a united, statewide C&S Program and conduct activities from pre-docketing through post-adoption of T-20 appliance standards.	• C&S Program managers meetings and on-going communication
2	C&S Program conducts full range of advocacy efforts during pre-rulemaking processes to support successful code change development through outreach and advocacy to stakeholders	• 2a Initial IOU assessment of measures/products indicates level of measure code-readiness
		• 2b. C&S Program support to CEC T20 RFI process
		• 2c. C&S Program stakeholder meetings, outreach and on-going communication with IOU EE program managers, CEC staff and industry stakeholders
		• 2d. C&S Program documentation of market feasibility and cost-effectiveness • Documentation of test methods and required test results
		• 2e. Negotiation meetings with advocates and industry stakeholders
3	IOUs share the code change screening results with the CEC and coordinate code change proposals with the CEC	• C&S program communications with CEC staff • C&S program assessments and recommendations presented to CEC
4	Initial CEC vetting of measures produces list of measures for consideration during the public rulemaking proceedings	• CEC analysis and workshop discussions of initial measures, public notices and scheduling of workshops • Supporting documentation from C&S Program
5	C&S Program conducts initial assessment of code change opportunities based on feasibility, cost-effectiveness, market readiness and acceptance, availability of test	• Documentation of compliance research, market feasibility, potential energy savings, and cost-effectiveness • C&S Program stakeholder meetings, outreach and on-going communication

	methods and data, etc.	• C&S Program supported test method development and test data • Communication with CEC, standard organizations committee members and other stakeholders
6	C&S program advocacy is presented at public CEC code proceedings	• CASE reports filed with CEC docket
7	C&S program advocacy is adopted voluntarily by industry or into local reach code ordinances	• Industry voluntary agreements and/or adoption of reach code standard based on IOUs C&S program negotiations
8	C&S Program conducts full range of advocacy efforts to support rulemaking processes and successful code change development	• 8a. Communication with CEC, standard organizations committee members and other stakeholders
		• 8b. CASE reports includes additional CEC requirements
		• 8c. Code enhancement support documents (compliance research, market feasibility, stakeholder outreach, and cost-effectiveness analyses)
9	CASE reports are revised and updated during the code proceeding process	• CASE reports documenting code change proposals that are cost-effective, feasible and enforceable • CASE reports include additional data, analysis and documentation based on comments raised during rulemaking
10	CASE reports are updated to include proposed code change language, test method requirements and additional information presented during the public rulemaking proceedings	• CEC analysis and workshop discussions, public notices and scheduling of workshops • Updated CASE reports filed with CEC docket supporting code change proposals and test methods that are cost effective, feasible and enforceable
11	C&S program provides technical responses to stakeholder issues raised in public rulemaking proceedings, including responding to comments and concerns voiced by stakeholders	• Communication with CEC, standard organizations committee members and other stakeholders • C&S Program input to stakeholder and CEC staff comments and questions on proposed code changes

12	IOU proposed code change language is included in the CEC adopted Title 20 standards	• Final published CASE reports • Updated Title 20 Standards adopted and published by CEC
13	IOUs draft CASE report recommendations is adopted voluntarily by industry or into local reach code ordinances	• Industry voluntary agreements and/or adoption of reach code standard based on draft CASE reports
14	C&S program provides technical responses to stakeholder issues raised in public rulemaking proceedings, including responding to comments and concerns voiced by stakeholders, which are then adopted voluntarily by industry or into local reach code ordinances	• Industry voluntary agreements and/or adoption of reach code standard based on docketed, revised CASE reports
15	Development of locally adopted reach code ordinances leads to integration of more efficient building practices into future CEC Rule-making	• Future CEC Title 20 code change proposal and IOU code enhancement proposals based on reach code influenced appliance standards
16	After new Title 20 standards are adopted C&S program initiates efforts to support the CEC in updating code compliance materials	• Communication with CEC, standard organizations committee members and other stakeholders
17	The adoption of stringent energy efficient standards accelerates market adoption of efficient technologies	• Increased market presence and acceptance of certified products • Initial compliance rates
18	C&S Program promotes development of infrastructure to ensure successful code change implementation	• C&S Program-supported electronic infrastructure development including electronic repository, pre-processing of electronic documents, and electronic input to the permit process
19	Compliance electronic infrastructure is accepted and adopted by the CEC	• CEC approves and implements compliance electronic infrastructure
20	Market adoption, accelerated by industry voluntary agreements and/or reach codes, leads to market acceleration	• Increased feasibility and market presence of efficient products and practices

21	The adoption of stringent energy efficiency standards accelerates market adoption of efficient technologies	• 21a. Increased market presence and acceptance of efficient certified products • 21b. Initial compliance rates
22	As market presence of high efficiency models increases, more products sold automatically meet the code requirement and compliance increases	• 22a. Increased market presence of efficient products improved compliance rate • 22b. Energy and water savings calculations with compliance rates
23	Adopted and implemented codes lead to advancement towards long term strategic goals	• State policy objectives are met to achieve environmental, macroeconomic, and other non-energy benefits

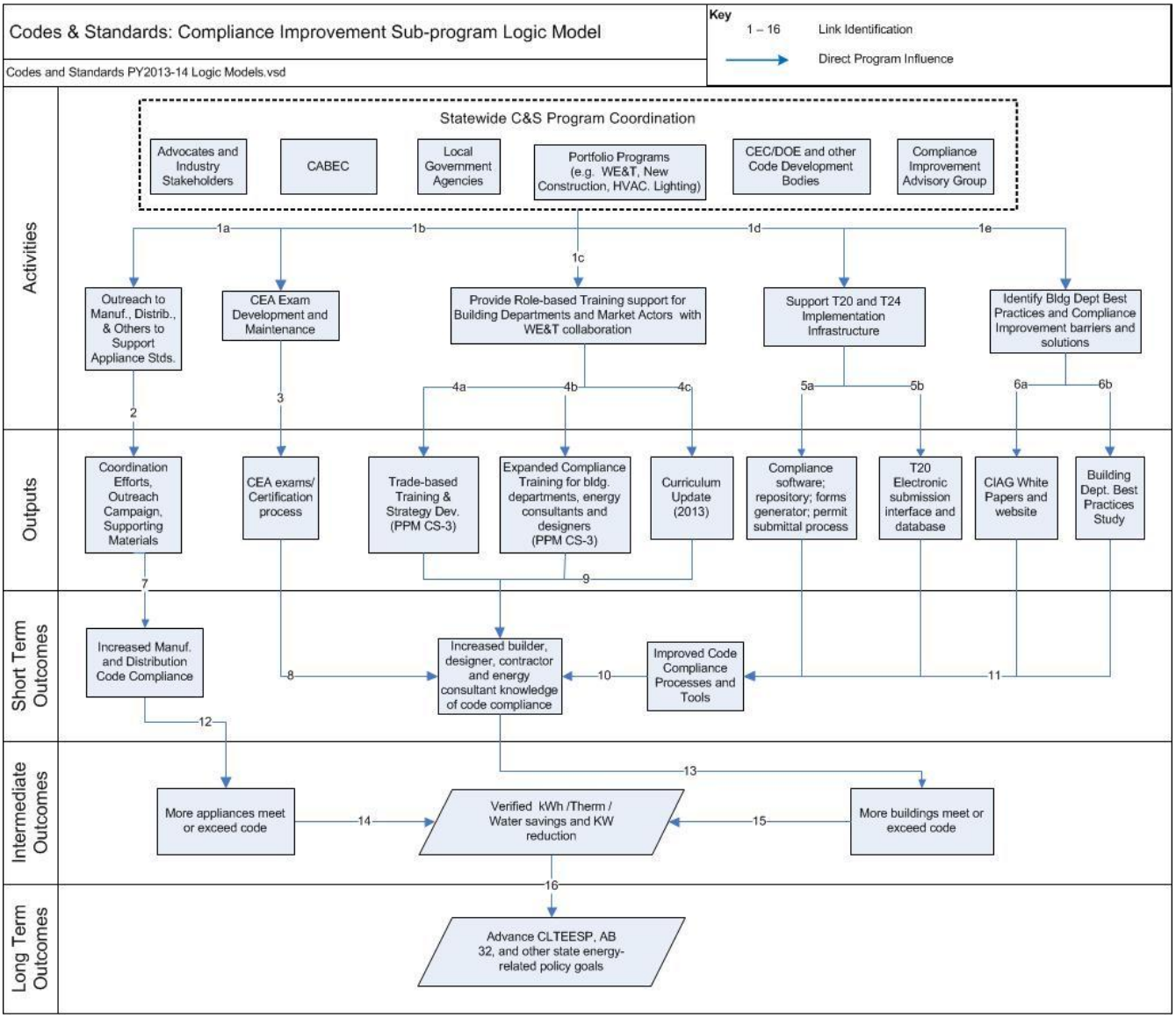

Codes and Standards: Appliance Standards Advocacy Sub-program Logic Model (Federal)
Codes and Standards PY2013-14 Logic Models.vsd
Key
1 - 20
Link identification
Direct Program Advocacy Efforts
Conditional Program Advocacy Efforts
Activities
Outputs
Short Term Outcomes
Intermediate Outcomes
Long Term Outcomes
Statewide C&S Program Coordination
Leverage T20 and Portfolio Program work for National Code Development Advocacy
National Codes and Standards Development and Advocacy
Coordinate with Ratings Organizations and Voluntary Programs
Post Adoption and Federal Standards Implementation Support
Participate in DOE and Other Federal Agency Meetings
Coordinate with Advocates and Industry Stakeholders
Research and Analyze Markets, Technologies, & Other Issues
Analyze DOE and Other Federal Agency Documents
Negotiate with Advocates and Industry Stakeholders
Support Improvements to Implementation Infrastructure
Public Testimony, Written Comments, Data and Other Findings
Advocate-Industry Consensus Agreement
Electronic submission interface and database
DOE Determination
New or Improved Efficiency or Test Standards, or Labels
DOE or Other Agency Publishes Final Rule
Congress enacts new legislation
CEC certified products sold in California
More efficient appliances sold in California
Verified kWh, therm, and water savings and kW reduction
More appliances meeting or exceeding code
Advance CLTEESP, AB 32, and other state energy-related policy goals
External Factors: Markets develop efficient, compliant products; Industry participation in standard change process; DOE and Other Agency decision making on Final Rule; Economic conditions

Codes and Standards: Appliance Standards Advocacy (Federal) Program Theory and Indicators

Link	Program Theory	Potential Indicators
1	C&S Program leverages the experiences and expertise of portfolio programs and Title 20 activities to identify areas for federal appliance standard improvement opportunities Portfolio programs leverage C&S Program's federal standards knowledge and expertise to identify new opportunities for programs	• Obtain market and technical information from portfolio programs • Obtain market and technical information from the Title 20 sub-program • Portfolio programs obtain federal appliance standards information from C&S Program
2	C&S Program leverages the experiences and expertise of portfolio programs to identify areas for state appliance standard improvement opportunities Portfolio programs leverage C&S Program's state standards knowledge and expertise to identify new opportunities for programs	• Obtain market and technical information from portfolio programs. • Portfolio programs seek and obtain state appliance standards information from C&S Program
3	C&S Program coordinates with national ratings organizations (e.g. FTC) and voluntary programs (e.g. ENERGY STAR), including the development of test standards or labeling requirements	• Coordination with ratings organizations such as FTC • Coordination with voluntary programs such as ENERGY STAR
4	As part of C&S Program advocacy to DOE, C&S Program conducts research and testing, analyzes DOE documentation for key technical and policy issues, and coordinates with both energy-efficiency advocates and industry stakeholders on issues related to the federal appliance standard including the development of new industry test methods	• 4a. Participation in meetings, including providing public testimony • 4b. Communication, including email and phone calls, with manufacturers, industry groups, and efficiency advocates • 4c. Research documentation and analysis in reports and internal communications • 4c. Participation in the development of industry test methods • 4d. Notes on key issues and internal communication regarding DOE documentation • 4e. Negotiation meetings with advocates and industry stakeholders
5	C&S Program drafts IOU written comments submitted to DOE in advocacy of standards, participates in DOE public meetings, provides public testimony, and communicates with DOE staff and their consultants during the rulemaking.	• Percentage of DOE rulemakings for which written comments are submitted by IOUs • Percentage of DOE meetings with IOU participation • Communication, including email and phone records, with DOE staff and their consultants. • Public testimony to DOE

6	C&S Program comments and findings lead to DOE determination of which standards to consider for rulemaking	• DOE determination notice of standards considered for rulemaking • Acknowledgment of IOU contributions in DOE determination notice
7	DOE determination to pursue standards for rulemaking	• DOE determination notice • DOE proceeds with rulemaking
8	C&S Program coordinates with other energy efficiency advocates and industry stakeholders to develop a consensus agreement on new standards and/or testing requirements, through a negotiation process C&S Program conditionally supports this pathway when it leads to quicker, greater energy savings than traditional rulemaking	• Communications, including email, phone records, conference calls and in-person meetings, with stakeholders • Internal review, research, analysis and communication on potential negotiation positions • Draft negotiation positions and final consensus agreement
9	DOE uses consensus agreement from efficiency advocates and industry as the basis of their final rule	• DOE sets new federal standards based on standard levels and other provisions of consensus agreement
10	C&S Program data, findings, comments and testimony support DOE appliance standards rulemaking to establish new or amended federal appliance standards, test procedures and/or labels.	• DOE Federal Register publications, technical documentation, and public meetings. • C&S Program public testimony, written comments, and data in support of new or amended federal appliance standards, test procedures and/or labels
11	DOE publishes final rule with new or amended appliance standards, or new or amended test procedure	• DOE Final Rule is published in the Federal Register
12	Advocate-industry consensus agreement is finalized and provided to Congress for possible enactment through energy legislation	• Submittal of final consensus agreement to Congress
13	Congress passes final energy legislation and President signs legislation into law C&S Program initiates efforts for post adoption implementation support	• Final enacted legislation • Communication with standard organizations committee members and other stakeholders to identify implementation support needs
14	DOE publishes a Final Rule to integrate new standards and/or test procedures established by Congress, and related provisions, into the Code of Federal Regulations. C&S Program initiates efforts for post adoption implementation support	• DOE Final Rule published in the Federal Register • Communication with standard organizations committee members and other stakeholders to identify implementation support need
15	C&S Program promotes development of, and	• C&S Program supported electronic

	improvements to, infrastructure to ensure successful code change implementation	infrastructure development and improvement including electronic repository, pre-processing of electronic documents, and electronic input to the permit process
16	Compliance electronic infrastructure is accepted and adopted by the CEC	• CEC approves and implements compliance electronic infrastructure
17	The adoption of stringent energy efficient standards accelerate market adoption of efficient technologies	• Increased market presence and acceptance of certified products • Initial compliance rates
18	The adoption of stringent energy efficient standards accelerates market adoption of efficient technologies The adoption of stringent energy efficient standards leads to more appliances meeting or exceeding code	• 18a. Initial compliance rates • 18b. Increased market presence and acceptance of efficient certified products
19	As market presence of high efficiency models increases, more products sold automatically meet the code requirement and compliance increases	• 19a. Increased market presence of efficient products demonstrates improved compliance rate • 19b. Energy and water savings calculations with compliance rates
20	Adopted and implemented codes lead to advancement towards long term strategic goals	• State policy objectives are met to achieve environmental, macroeconomic, and other non-energy benefits


Codes & Standards: Compliance Improvement Sub-program Logic Model
Codes and Standards PY2013-14 Logic Models.vsd
Key
1 – 16
Link Identification
Direct Program Influence
Activities
Outputs
Short Term Outcomes
Intermediate Outcomes
Long Term Outcomes
Statewide C&S Program Coordination
Advocates and Industry Stakeholders
CABEC
Local Government Agencies
Portfolio Programs (e.g. WE&T, New Construction, HVAC. Lighting)
CEC/DOE and other Code Development Bodies
Compliance Improvement Advisory Group
1a
1b
1c
1d
1e
Outreach to Manuf., Distrib., & Others to Support Appliance Stds.
CEA Exam Development and Maintenance
Provide Role-based Training support for Building Departments and Market Actors with WE&T collaboration
Support T20 and T24 Implementation Infrastructure
Identify Bldg Dept Best Practices and Compliance Improvement barriers and solutions
2
3
4a
4b
4c
5a
5b
6a
6b
Coordination Efforts, Outreach Campaign, Supporting Materials
CEA exams/ Certification process
Trade-based Training & Strategy Dev. (PPM CS-3)
Expanded Compliance Training for bldg. departments, energy consultants and designers (PPM CS-3)
Curriculum Update (2013)
Compliance software; repository; forms generator; permit submittal process
T20 Electronic submission interface and database
CIAG White Papers and website
Building Dept. Best Practices Study
7
9
Increased Manuf. and Distribution Code Compliance
Increased builder, designer, contractor and energy consultant knowledge of code compliance
Improved Code Compliance Processes and Tools
8
10
11
12
13
More appliances meet or exceed code
Verified kWh /Therm / Water savings and KW reduction
More buildings meet or exceed code
14
15
16
Advance CLTEESP, AB 32, and other state energy-related policy goals

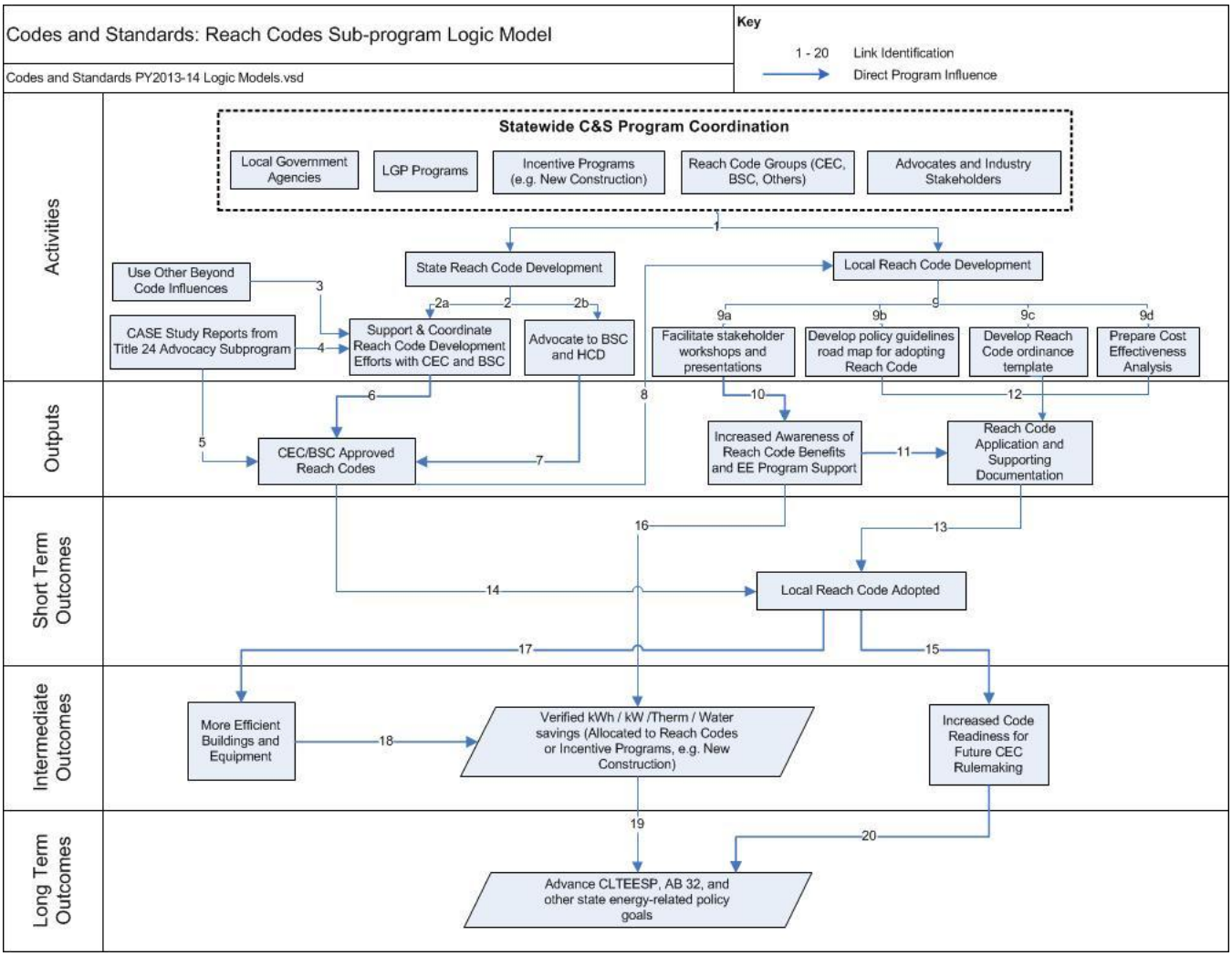
Codes and Standards: Compliance Improvement Program Theory and Indicators

Link	Program Theory	Potential Indicators
1	C&S Program coordinates with advocates and industry stakeholders, CABEC, local government agencies, CEC/DOE/other code development bodies, Compliance Advisory Group (CIAG), other IOU portfolio programs, and other organizations	• Communication with collaborative members
1a	C&S program coordinates efforts with the appliance industry in improving code compliance through outreach to manufacturers, distributors and others to support appliance standards C&S program supports CEC outreach efforts C&S program staff attends trade shows, meetings and other outreach venues	• Number of manufacturers contacted • Number of meetings • Participation in trade shows • Number of training sessions
1b	C&S Program supports Certified Energy Analyst (CEA) examination development and maintenance, and training programs for various industry groups C&S program supports CABEC in developing technical and administrative guidelines to update the residential and nonresidential CEA examinations developed in 2010-2012 to properly test applicant CEAs under the 2013 standards and facilitating the roll out of the new certification process C&S Program assembles and trains a team of subject-matter experts to prepare exam questions	• A trained team of subject-matter experts • Set of exam questions • Blueprint for exam preparation • Alpha and Beta test developed • Exam standards developed
1c	C&S program in collaboration with Workforce Education and Training sub-program (WE&T) prepare and deliver role-based training for building departments, energy consultants, designers, contractors and technicians to improve current code compliance	• Number of courses prepared • Number of sessions delivered • Number of course participants
1d	C&S program coordinates with the CEC/ DOE to provide T24 and T20 implementation infrastructure support	• Number of statewide/ CEC coordination meetings • Needs assessment recommendations

Link	Program Theory	Potential Indicators
	C&S Program identifies building department best practices, and compliance improvement barriers and solutions through a needs assessment	
1e	C&S Program assembles and facilitates the Compliance Improvement Advisory Group (CIAG). CIAG acts as 'ear-to-the-ground' to identify and prioritize compliance improvement initiatives for the C&S Program CIAG members represent CEC, California State License Board (CSLB), architects, builders, home energy raters, contractors, energy consultants, compliance software developers, and building officials C&S Program collaborates with a select group of building departments across the state to identify best practices for enforcing Title 24	• An Advisory Group representative of key compliance improvement market actors • Number of CIAG coordination meetings • Number of participating building departments
2	C&S Program coordinates with the CEC to conduct outreach to equipment manufacturers on existing code requirements, and to facilitate compliance from both a technical and administrative perspective C&S Program assists manufacturers to ensure equipment sold in California meets the minimum technical requirements, and to successfully complete the certification process with the CEC C&S Program staff write articles for CEC Blueprint and other publications addressing T20/T24 requirements	• Campaign supporting materials • Number of manufacturers receiving assistance on use of CEC appliance database • Number of distributors informed • Number of articles published addressing T20/T24 requirements
3	C&S Program assists CABEC with the design, implementation and marketing of the CEA certification process, incorporating inputs from CEC	• CABEC certification process website • Number of certified Energy Analysts
4a	C&S Program collaborates with WE&T, CEC and major industry trade groups to develop and deliver enhanced workforce education and training to ensure proper installation,	• Needs assessment recommendations • Number of industry-specific courses • Number of training sessions • Number of participants

Link	Program Theory	Potential Indicators
	commissioning and maintenance as per code	
4b	C&S Program develops and implements compliance training to building departments, energy consultants and designers that expands beyond classroom-based training to include live webinars and other activity-based online training	• Number of training sessions • Number of courses developed • Number of training sessions • Number of participants
4c	C&S Program updates the current role-based building department and energy consultant training curriculum incorporating feedback from the CEC,WE&T and CIAG	• Updated curriculum to reflect 2013 Title 24 Standards
5a	C&S Program provides support to CEC/CPUC to develop a framework for an electronic repository database C&S Program coordinates with the CEC and Emerging Technologies Program (ETP) on needs assessment study to explore the potential for developing electronic compliance forms and technology options for a pilot online permitting process	• Needs assessment recommendations
5b	C&S Program provides feedback and support to CEC/CPUC to develop an improved user interface for the CEC appliance database	• Interface improvement recommendations
6a	CIAG prepares white papers that identify and prioritize compliance-specific issues, propose solutions and recommend next steps for C&S Program consideration C&S Program supports and maintains CIAG website that houses the white papers and collects feedback and disseminates information	• Issue-specific white papers (4-8) • CIAG website
6b	C&S Program, using information obtained from needs assessment and gap analysis, develops and tests building department-specific tools, training and strategies for optimizing Title 24 enforcement C&S Program works collaboratively with participating building departments to document best practices that are shared with local jurisdictions statewide	• Comprehensive best practices assessment and gap analysis report • Tools, training materials and implementation strategies
7	C&S Program outreach and coordination efforts results in increased awareness among	• Increased number of certified products in CEC appliance database

Link	Program Theory	Potential Indicators
	manufacturers and distributors	• Increase in availability of compliant products
8	Stringent CEA exam and certification process results in increased number of proficient energy analysts which leads to better code compliance	• Number of certified energy analysts • Increased number of compliant buildings • More accurate compliance documentation
9	Effective role-based and trade-based training results in increased code compliance knowledge among builders, contractors and designers which leads to better code compliance	• Increase in standards knowledge of training attendees (pre and posttests)
10	Improved processes and tools results in increased builder, designer, contractor and energy analyst code compliance knowledge	• Increased builder, designer, contractor and energy analyst knowledge of code compliance
11	Best practices study; CIAG white papers and website; improved Title 20/Title 24 electronic submission interface and database; and improved compliance software, repository, forms generator and permit submittal process increase the effectiveness of code compliance processes and tools, and reduce the frequency of compliance errors	• Reduced number of compliance errors due to resources and training • Reduced time for building officials to process paperwork
12	Outreach and compliance support in appliance manufacturing and distribution channels results in more appliances meeting code and greater utilization of efficient appliances and technologies	• Reduction in number of noncompliant appliances in the market • Increased utilization of efficient appliances and technologies
13	Improved compliance infrastructure, system and modeling software leads to more buildings meeting or exceeding T24 requirements	• Energy savings calculations submitted for permit approval with compliance rates
14	More effective enforcement processes, increased knowledge of code requirements throughout the market increases the number of appliances meeting or exceeding code, which results in verified kwh/ therm and water savings, and kw reduction	• kwh savings • therm savings • water savings • kw reduction
15	Adopted and implemented codes lead to advancement towards long term strategic goals	• State policy objectives are met to achieve environmental, macroeconomic, and other non-energy benefits


Codes and Standards: Reach Codes Sub-program Logic Model
Codes and Standards PY2013-14 Logic Models.vsd
Key
1 - 20 Link Identification
Direct Program Influence
Activities
Outputs
Short Term Outcomes
Intermediate Outcomes
Long Term Outcomes
Statewide C&S Program Coordination
Local Government Agencies
LGP Programs
Incentive Programs (e.g. New Construction)
Reach Code Groups (CEC, BSC, Others)
Advocates and Industry Stakeholders
Use Other Beyond Code Influences
State Reach Code Development
Local Reach Code Development
CASE Study Reports from Title 24 Advocacy Subprogram
Support & Coordinate Reach Code Development Efforts with CEC and BSC
Advocate to BSC and HCD
Facilitate stakeholder workshops and presentations
Develop policy guidelines road map for adopting Reach Code
Develop Reach Code ordinance template
Prepare Cost Effectiveness Analysis
CEC/BSC Approved Reach Codes
Increased Awareness of Reach Code Benefits and EE Program Support
Reach Code Application and Supporting Documentation
Local Reach Code Adopted
More Efficient Buildings and Equipment
Verified kWh / kW /Therm / Water savings (Allocated to Reach Codes or Incentive Programs, e.g. New Construction)
Increased Code Readiness for Future CEC Rulemaking
Advance CLTEESP, AB 32, and other state energy-related policy goals

Codes and Standards: Reach Codes Program Theory and Indicators

Link	Program Theory	Potential Indicators
1	C&S Program coordinates and supports internal and external efforts to drive reach codes development and adoption, using the resources offered by the IOU Energy Efficiency and Local Government Partnership programs; and working with the CEC, Building Standards Committee (BSC), and industry groups	• Communication and meetings with CEC, standard organizations committee members and other stakeholders for model reach code ordinances • Communication and meetings with local jurisdictions to develop their reach code ordinances • Quarterly updates to LGP (Local Government Partnership) program regarding reach code adoption progress and delivery of training to building departments • Coordination efforts with local government agencies in conducting rulemaking process • Coordination of reach code features with IOU energy efficiency program offerings where possible • Coordinated C&S program and LGP outreach efforts to local jurisdictions • Solicitation for stakeholder involvement and work with stakeholders
2	C&S Program collaborates with CEC and BSC to provide support for developing local reach code ordinances to encourage buildings to achieve exemplary performance in the areas of energy efficiency	• 2a: Stakeholder meetings, outreach and on-going communication with CEC and BSC in development of statewide reach codes solutions such as CALGreen • 2b: Communication with BSC and HCD to advocate the benefits of the reach code
3	C&S Program supports the CEC/BSC CALGreen Tier 1 and Tier 2 standards development by leveraging C&S Program involvement in ASHRAE Standard 189 and other "beyond code" activities (e.g. CHPS)	• Stakeholder meetings, outreach and on-going communication with CEC and standards organization staff • Participation in ASHRAE 189 committee meetings and other "beyond code" organization activities
4	C&S Program CASE reports presented at reach code development meetings	• CASE reports include data, analysis and documentation for reach code development

5	IOU proposed code change language is included in CEC adopted reach code standards	• Adoption of CEC-approved reach codes by BSC includes IOU proposed code change language
6	C&S Program efforts support the development of energy efficiency reach standards by CEC and BSC	• Adoption of CEC-approved reach codes by BSC • Support and contributions to CEC/BSC reach codes efforts, in particular CALGreen
7	C&S Program advocacy to BSC and HCD to support adoption of energy efficient standards into CALGreen	• Advocacy for industry energy efficiency standards, such as ASHRAE Std 189, influence the CEC-approved reach codes adopted by BSC
8	BSC adopted reach code (CALGreen) is used for the basis of local reach code development	• Local ordinance development begins with consideration of BSC adopted reach code (e.g. CalGreen Tier 1 or 2) • Increase in regional code consistency (countywide or geographically contiguous jurisdictions)
9	C&S Program conducts full range of advocacy efforts to support to rulemaking processes and ensure successful reach code development, completed in collaboration with the local government, CEC, BSC, and others	• 9a. Stakeholder meetings, outreach and on-going communication • 9b. "Road Map" of policy guidelines for adopting reach code • 9c. Reach code ordinance "template" that establishes clear definitions of when the ordinance is triggered • 9d. Reach code cost-effectiveness documentation
10	Stakeholder outreach by C&S Programs and LGP increase reach code awareness and knowledge	• Responses to requests for technical assistance from local government officials and stakeholders • Input to stakeholder comments and questions on proposed code changes
11	C&S Program supports local government officials in the reach code application process by responding to requests for technical assistance and support materials	• Technical support material and reach code policy and adoption guidance to local governments upon request
12	Local governments conduct rulemaking process, develop ordinance with technical support from C&S Program	• Local ordinance adoption proceedings • Reach code application developed with support from C&S Program

13	C&S Program support leads to adopted local reach code ordnances	• Reach code ordinance adoption published by local jurisdictions
14	CEC/BSC model reach code, with C&S Program proposed code change language, is adopted by local ordinances	• Reach code ordinance adoption published by local jurisdictions
15	Development of locally adopted reach code ordinances leads to integration of more efficient building practices into future CEC rulemaking	• Increased acceptance and experience of reach code measures by builders, designers, and contractors prepares the market for future CEC reach codes
16	Stakeholder outreach and technical support by LGP and C&S Programs increase awareness and knowledge of reach code and EE incentive program benefits, resulting in greater utilization of efficient appliances and technologies	• Increased utilization of efficient appliances and technologies • Reduction of noncompliant practices and appliances
17	Adoption of reach code ordinances leads to more efficient buildings and equipment	• Increased market acceptance of reach code requirements and practices throughout the state
18	More efficient buildings result in electric and gas energy savings, demand reduction, and water savings	• Energy savings calculations or building energy and water usage
19	Adopted and implemented codes lead to advancement towards long term strategic goals	• State policy objectives are met to achieve environmental, macroeconomic, and other non-energy benefits
20	Increased market acceptance of building practices resulting from reach codes leads to advancement towards long term strategic goals	• Accelerated completion of state policy objectives to achieve environmental, macroeconomic, and other non-energy benefits

Appendix 1 Glossary of Acronyms

Acronym/Term	Description
AB 32	California Assembly Bill AB 32, California Global Warming Solutions Act of 2006
ACM	Alternate Component Method, The CEC's Public Domain Computer Programs, one of the CEC's Simplified Calculation Methods, or any other calculation method approved by the CEC.
AHRI	Air-Conditioning, Heating and Refrigeration Institute
ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers
ASHRAE 90.1	Energy Standard for Buildings Except Low-Rise Residential Buildings
ASHRAE 189	Standard for the Design of High-Performance, Green Buildings Except Low-Rise Residential Buildings
ASTM	American Society for Testing and Materials Now referred to as ASTM International
BSC	California Building Standards Commission
C&S	Codes and Standards program
CA	California
CABEC	California Association of Building Energy Consultants
CALBO	California Building Officials
CARB	California Air Resources Board
CASE	Codes and Standards Enhancement
CEC	California Energy Commission
CEE	Consortium for Energy Efficiency
CEPs	Compliance Enhancement Programs
CEQA	California Environmental Quality Act
CHPS	Collaborative for High Performance Schools
CPUC	California Public Utilities Commission
CRRC	Cool Roof Rating Council
CSLB	California State License Board
CSU	California State University
DOE	United States Department of Energy
DCA	California Department of Consumer Affairs
DR	Demand Response
DTSC	California Department of Toxic Substance Control
DSA	California Division of State Architect
DWR	California Department of Water Resources
EE	Energy Efficiency
EISA 2007	United States Energy Independence and Security Act of 2007
EOA	Extension of Advocacy
EPA	United States Environmental Protection Agency
ET (ETP)	Emerging Technologies (Emerging Technologies Program)
FDD	Fault Detection and Diagnostics
GHG	Greenhouse Gas
Green Globes	Green building rating system as administered by the Green Building Initiative
HCD	California Department of Housing and Community Development
HERS	Home Energy Rating System
HID	High Intensity Discharge

Acronym/Term	Description
Huffman Bill (AB1109)	California Assembly Bill AB 1109, Lighting Efficiency and Toxics Reduction Act
HVAC	Heating, Ventilating and Air Conditioning
IBEW	International Brotherhood of Electrical Workers
ICC	International Code Council
IESNA	Illuminating Engineering Society of North America
IOU	California Investor Owned Utility (PG&E, SCE, SDG&E, SCG)
LAUSD	Los Angeles Unified School District
LEED	Leadership in Energy and Environmental Design Green building rating system as administered by the USBGC
LG	Local Government
LGC	Local Government Commission
M&V	Measurement and Verification
NECA	National Electrical Contractors Association
NFRC	National Fenestration Rating Council
NRDC	National Resources Defense Council
OSHPD	California Office of Statewide Health Planning and Development
PG&E	Pacific Gas and Electric
RC	Reach Code
Reach Code	Codes, standards, regulations, policies and programs that exceed minimum energy codes such as Title 24, Title 20, ASHRAE Standard 90.1
ResNet	Residential Energy Services Network
SCE	Southern California Edison
SCG	Southern California Gas
SDG&E	San Diego Gas and Electric
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
SMUD	Sacramento Municipal Utility District
Title 20	Title 20, California Appliance Efficiency Regulations, Section 1601 et seq. of the California Code of Regulations.
Title 24	Title 24, California Building Energy Efficiency Standards, as set forth in the California Code of Regulations, Title 24, Part 6. Also known as the *California Energy Code.*
TDV	Time Dependent Valuation is the time varying energy caused to be used at by the building to provide space conditioning and water heating and for specified buildings lighting, accounting for the energy used at the building site and consumed in producing and in delivering energy to a site, including, but not limited to, power generation, transmission and distribution losses.
TOS	Time of Sale
UC	University of California
USGBC	United States Green Building Council
WE&T	Workforce, Education and Training

Appendix 2 - 2013 – 2014 Codes and Standards PIP Addendum

Codes and Standards Program Overview

The Codes and Standards (C&S) Program saves energy on behalf of ratepayers by influencing continuous improvements in energy efficiency regulations, improving compliance with existing codes and standards, and working with local governments to develop ordinances that exceed statewide minimum requirements. C&S program activities extend to all buildings and potentially any appliance in California, for both advocacy and compliance improvement.

The C&S Program consists of five subprograms: Building Codes Advocacy; Appliance Standards Advocacy; Compliance Improvement; Reach Codes; and, Planning and Coordination.

1. Building Codes Advocacy Subprogram

   The Building Codes Advocacy subprogram primarily targets improvements to Title 24 Building Efficiency Regulations that are periodically updated by the California Energy Commission. The subprogram also seeks changes to national building codes that impact CA building codes. Advocacy activities include, but are not limited to, development of code enhancement proposals and participation in public rulemaking processes. The program may coordinate with or intervene in ratings organizations that are referenced in Title 24; for example, the National Fenestration Rating Council, and the Cool Roof Rating Council.

2. Appliance Standards Advocacy Subprogram

   The Appliance Standards Advocacy subprogram targets both state and federal standards and test methods: improvements to Title 20 Appliance Efficiency Regulations by the California Energy Commission, and improvements to Federal appliance regulations by the US Department of Energy. Advocacy activities include, but are not limited to, development of code enhancement proposals and participation in the public rulemaking process (Title 20), and comment letters based on IOU research and analysis (USDOE), and participation in direct negotiations with industry. Additionally, the program monitors state and federal legislation and intervenes, as appropriate.

3. Compliance Improvement

   The Compliance Improvement subprogram is a new subprogram that combines the previous Extension of Advocacy and Compliance Enhancement subprograms. It provides education, training, and other activities targeting building departments and other industry actors responsible for compliance with Building Energy Code and Appliance Standards requirements. Activities may include development of "best practices tools" and other infrastructure elements that serve multiple compliance improvement objectives.

4. Reach Codes Subprogram

   The Reach Codes subprogram provides technical support to local governments that wish to adopt ordinances that exceed statewide Title 24 minimum energy efficiency requirements for new buildings, additions, or alterations. Support for local governments includes research and analysis for establishing performance levels relative to T-24 and cost effectiveness per Climate Zone, drafting of model ordinance templates for regional consistency, and assistance

for completing and expediting the application process required for approval by the CEC. The subprogram also supports local governments that seek to establish residential or commercial energy conservation ordinances for existing buildings.

5. Planning and Coordination

   The Planning and Coordination Subprogram provides a formal process that aligns planning activities across the IOU energy efficiency portfolio within the Codes and Standards program activities. This subprogram supports efforts to prepare the market for future code adoption (i.e., improve code readiness), to ensure higher code compliance rates and advance the CPUC Strategic Plan goals for achieving Zero Net Energy.

Codes and Standards 2013-2104 Activities by Sub-Programs

Building Energy Codes Advocacy

The Building Codes Advocacy program will continue conducting many of the same activities as were conducted in the 2010 – 2012 program cycle, but will focus on the upcoming 2016 Title 24 Energy Building Code cycle. In addition, the Building Codes Advocacy sub-program will expand activities at the national level. Primary activities for 2013-2014 include the following:

2013 Title 24 Energy Building Code

- Support implementation of adopted 2013 Energy Building Code:
  - Complete revisions to compliance manuals and forms

2016 Title 24 Energy Building Code

- Prepare CASE studies in coordination with CEC:
  - Conduct research for 2016 building code advocacy to advance State policy goals
  - Support activities to address Department of Finance review requirements
  - Research residential ventilation / IAQ requirements to reduce and control infiltration while maintaining and improving indoor air quality
  - Research and advocate methods to remove code barriers to the increased use of renewable energy in support of ZNE goals
  - Support development of 2016 compliance software

Appliance Standards Advocacy

The Appliance Standards Advocacy program will continue conducting many of the same activities as were conducted in the 2010–2012 program cycle, but will focus on preparing new measures pursuant to CEC's adopted Order Instituting Rulemaking ("OIR") for Title 20 Appliance Standards and U.S. Department of Energy's ongoing rulemaking for Federal Appliance Standards. Primary activities for 2013-2014 include the following:

Title 20 Appliance Standards Rulemaking

- Prepare CASE studies pursuant to CEC's adopted OIR:
    - Advocate and provide public testimony in State public proceedings
    - Conduct research and testing and submit supporting market and technical data to the CEC
    - Participate in consensus negotiations with industry and energy advocacy groups (which typically develop standards levels which CEC eventually adopts)
    - Develop voluntary agreements or reach standards

Federal Appliance Standards Rulemaking

- Provide support to DOE rulemaking process:
    - Advocate and provide public testimony in Federal public proceedings
    - Submit supporting market and technical data to the Department of Energy
    - Participate in consensus negotiations with industry and energy advocacy groups (which typically develop standards levels which DOE eventually adopts)
    - Develop voluntary agreements or reach standards

Compliance Improvement

For the 2013-2014 program cycle, the C&S team will combine the former Extension of Advocacy and Compliance Enhancement Program activities into one Compliance Improvement subprogram to enhance understanding of program objectivities and activities. The subprogram will strive to improve compliance with the Title 24 and Title 20 efficiency standards while implementing an effective sector strategy with the Workforce Education and Training Program. Primary activities for 2013-2014 include the following:

Title 24 Compliance

- Title 24 Standards Essentials Role-Based training for building inspectors:
  - Continue delivering training to plans examiners and energy consultants. Update curriculum to cover what's new in the 2013 code. *(per OP 93)*
  - Expand role-based training curriculum to additional compliance improvement market actors such as the building trades and design professionals as guided by needs assessment

- HVAC Quality Installation and Other Programs with Direct Code Requirements
  - Identify opportunities to insert code compliance modules in existing curriculum, such as training required for technicians

- On-line Compliance Training:
  - Explore training delivery mechanisms beyond the traditional classroom to include live webinars, activity-based online training, and in-field demonstrations

- Tools and Process Improvements:
  - Implement tools and process improvements as identified through the building department best practices study and the Compliance Improvement Advisory Group (CIAG)

- Forms and Compliance Documents:
  - Support development of improved forms and compliance-related documentation for 2013 Title 24

- Nonmonetary Compliance Improvement Incentives:
  - Explore a pilot project designed to improve compliance by providing incentives to local governments, contractors, or other key market actors. The pilot will be based on the CIAG's guidance and may include nonmonetary incentives such as training or provision of tools designed to streamline the permitting and inspection processes for additions and alterations *(per OP 94)*

- Target Low Compliance Problem Areas:
  - Collaborate with the CEC to identify problem areas and potential compliance improvement solutions through white papers developed by CIAG members *(per OP 95)*

- Consider pilot project to improve compliance for measures with known challenges, which may include providing incentives to contractors for pulling permits, or motivation for other market actors. *(per OP 95)*

- Develop and Conduct Outreach Campaign to Improve Compliance:
  - Collaborate with the CEC to develop and implement an outreach campaign designed to improve compliance with Title 24 and Title 20 standards. The campaign will be based on the CIAG's guidance and may include activities such as developing flyers for contractors to provide to potential customers explaining the code requirements and benefits, mini measure-based code seminars for big box store employees, etc. *(per OP 93)*

- CEA exam development, facilitation support, and maintenance
  - Collaborate with the California Association of Building Energy Consultants to improve the working knowledge, skills, analytic ability and accountability of individuals using energy compliance software and preparing the appropriate Title 24 documentation for permit submittal. C&S will support updating the beta Residential and Nonresidential CEA examinations developed in 2010-2012 to properly test applicant CEAs under the 2013 standards and facilitating the roll out of the new certification process.

Title 20 and Federal Standards Compliance

- Surveys and Technical Support:
  - Conduct surveys and provide technical support to CEC and industry to facilitate compliance.

- Education and Outreach:
  - Collaborate with CEC on implementing an education and outreach campaign targeted to distributors, retailers, contractors, and possibly consumers. *(OP 93)*

Reach Codes

For the 2013-2014 program cycle, the IOUs will continue to collaborate with the CEC and Local Government Partnership Program to identify, and provide technical assistance to, local jurisdictions interested in adopting Reach Codes. In addition, the IOUs will continue to collaborate with CEC to provide support for developing voluntary standards to encourage buildings to achieve exemplary performance in the areas of energy efficiency. Primary Reach Code activities for 2013-2014 include the following:

Reach Code Technical Assistance

- Cost Effectiveness Studies:
  - Prepare Cost Effectiveness studies for each of the California climate zones (to be updated for 2013 Energy Building Code) that have been vetted with the CEC, resulting in expedited CEC review of reach code application submittals.

- Policy Guidelines:
  - Provide a "Road Map" of Policy Guidelines for adopting Reach Code including an overview of some of the implications and important choices in writing and adopting these types of ordinances, and recommendations intended to improve implementation and compliance.

- Ordinance Template:
  - Provide a Reach Code Ordinance "template" that establishes clear definitions of when the ordinance is triggered, including CEC-required language which states that all buildings shall meet all applicable requirements of the Building Energy Code.

- Workshops & Presentations:
  - Facilitate public workshops and presentations to interested stakeholders including elected officials, city staff, industry organizations, and community groups that address the following:
    - Critical role that energy efficiency plays in reducing greenhouse gas emissions
    - Understand how Reach Codes and complementary new construction incentive programs such as California Advanced Homes help meet CalGreen's voluntary Tier 1 and Tier 2 Energy requirements, accelerate advancement of zero net energy building practices, and mitigate project-level GHG impacts pursuant to CEQA requirements.
    - Explain the process for developing and adopting a legally enforceable Reach Code pursuant to CEC requirements

  - Work with industry organizations and other market actors to conduct outreach to local governments to inform them of available Reach Code assistance.

Planning and Coordination (Non-Resource Subprogram)

The Planning and Coordination Subprogram supports planning activities that improve alignment across the IOU energy efficiency portfolio with respect to future C&S program activities. C&S staff will coordinate with IOU energy efficiency portfolio programs to support efforts to prepare the market for future code adoption (i.e., improve code readiness), to ensure higher code compliance rates and advance the CPUC Strategic Plan goals for achieving Zero Net Energy.

This subprogram will consist of four elements: 1) Strategic planning and coordination; 2) Outreach within each IOU to other program areas; 3) Statewide planning and coordination; and, 4) Workforce education and training. Primary activities for 2013-2014 include the following:

Strategic Planning (per OP 91)

- Codes and Standards Collaborative:
  - Maintain a Codes and Standards Collaborative to conduct strategic planning

- Code Readiness:
  - Establish cross-functional teams, including representatives from voluntary programs (incentive, emerging technologies, and education and training), the CPUC, and the CEC, will be established to identify code readiness priorities relative to policy goals, for example: zero net energy, AB 1109, and other Action Plan objectives.

Internal Coordination and Communications

- Periodic Meetings:
  - Conduct a variety of internal coordination activities based on respective needs of each IOU, including periodic meetings with program leads in other areas as well as management teams.

- Ongoing Communication:
  - Inform planners and support groups regarding future code changes, collaboration on evaluation and regulatory matters.
  - Solicit input from other groups re advocacy efforts, aligning education and training activities with incentive programs.

Statewide Collaboration

- Integrated Dynamic Approach to Portfolio Planning:

  - To support the state's Zero Net Energy objectives, the C&S team, will work closely with new construction programs to develop an integrated approach to align new construction program offerings with base code requirements as well as reach codes where possible.
  - The C&S team will work with core retrofit programs as well as local government partnerships and third parties to coordinate offerings with anticipated code changes. *(per OP 91, 152)*

- CPUC Communication:
  - Conduct monthly calls with CPUC personnel to share progress and discuss issues *(per OP 91)*

- CEC Communication:
  - Maintain statewide weekly calls with CEC staff regarding building codes and appliance standards *(per OP 91)*

- National Stakeholders Communication:
  - Conduct regular conference calls with national stakeholders regarding appliances *(per OP 91)*

- Compliance Advisory Group Communication:
  - Host quarterly meetings with Compliance Improvement Advisory Group regarding compliance improvement activities *(per OP 91, 152)*

- Local Government Partnership Communication:
  - Provide quarterly updates to Local Government Partnership Program regarding reach code adoption progress and delivery of training to building departments *(per OP 91)*

<u>Workforce Education and Training (WE&T)</u>

- Sector Strategies for WE&T:
  - C&S and WE&T personnel will meet periodically to coordinate activities that will enhance support for the appropriate market actor roles responsible for new and emerging codes and standards implementation according to priorities established by needs assessments. C&S will collaborate with the WE&T Centergies sub-program to not only prepare contractors and technicians to implement current codes, but to also prepare them with technical training on advanced technologies that are projected to become part of reach codes and then the statewide code. *(per OP 92 and OP 152)*